A Chilton Publication

# The Iron Age

E NATIONAL METALWORKING WEEKLY • SEPTEMBER 23, 1954

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**Recent developments in lowest cost melting described in Whiting booklet**

This important new 24-page booklet describes the new Whiting Model "C" Cupola. It also contains illustrations and complete description of cupola accessories and special cupolas. Write for it today!

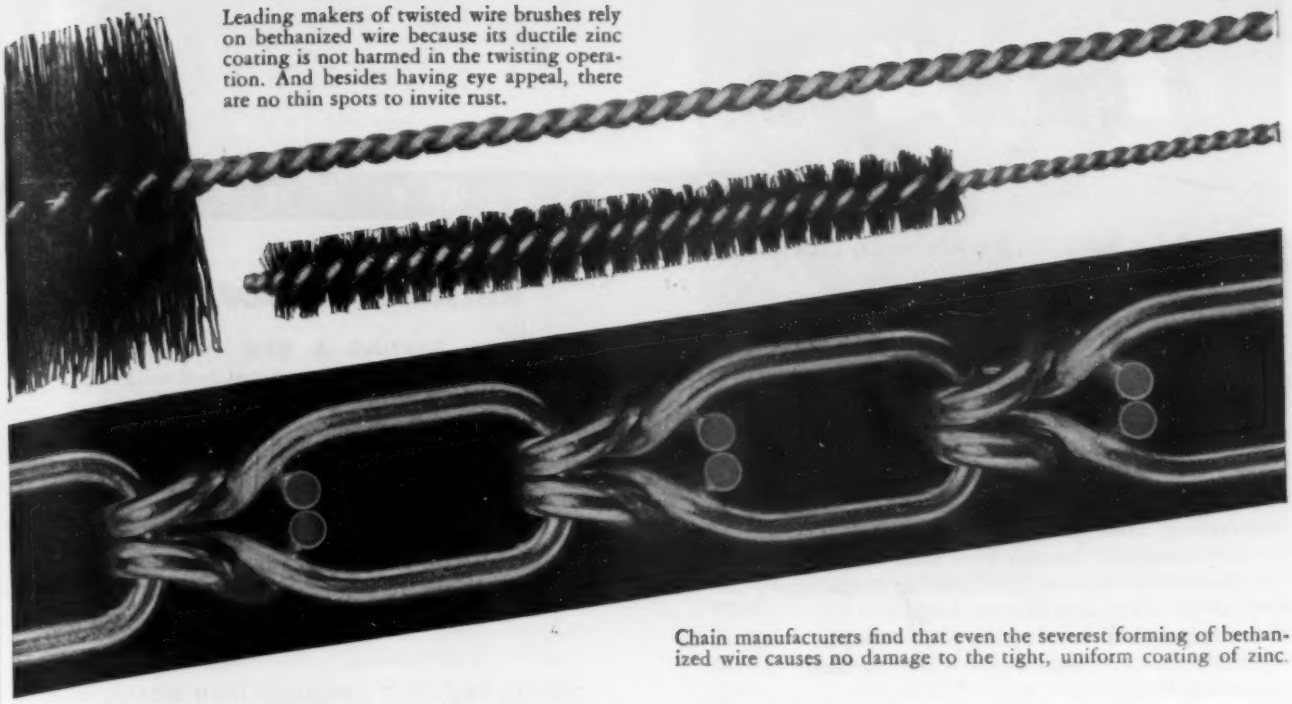
**WHITING CORPORATION**

15601 Lathrop Ave., Harvey, Illinois

Whiting Corp. (Canada) Ltd., P.O. Box 6, Station "D", Toronto 9, Ont.

**READ ABOUT:**

- The new Whiting Model "C" Cupola
- The new Whiting single pass recuperative hot blast system and other Whiting hot blast systems
- Advantages of small Whiting cupolas
- Whiting Type "MR" cupola tuyeres
- Discussions of various aspects of cupola design and operation
- Sizes, capacities and specifications for Whiting cupolas
- Complete lining data for all sizes of Whiting cupolas
- Selection and ordering information and instructions



Leading makers of twisted wire brushes rely on bethanized wire because its ductile zinc coating is not harmed in the twisting operation. And besides having eye appeal, there are no thin spots to invite rust.

Chain manufacturers find that even the severest forming of bethanized wire causes no damage to the tight, uniform coating of zinc.

# Pure zinc . . . perfectly bonded to steel . . . that's bethanized wire

What sets bethanized wire apart, above any other feature, is the perfect bond between the pure zinc coating and the steel base. As the wire goes through the bethanizing process, pure zinc is electrolytically deposited on the steel, atom by atom, building up a tight, uniform protective armor.

That is why bethanized wire is hard to beat for corrosion-resistance. The zinc coating is so even that there are no thin spots where corrosion can find a foothold, and so ductile that it goes through severe forming and fabrication without damage.

The sparkle of pure zinc adds eye-appeal to wire products. Now is a good time to see what bethanized wire can do for you. Either light or heavy coating weights can be supplied in hard- or soft-temper wire. Our nearest sales office will give you complete information.

Here's an easy way to judge bethanized wire for yourself . . . let us mail you a small sample piece. You can twist it, bend it, wrap it around its own diameter—even draw it through dies—and the ductile zinc won't crack or peel off.

Write now for your sample. Address your request to Bethlehem Steel Co., Room 1037, Bethlehem, Pa. If you want enough bethanized wire for a production test, our Sales Department will gladly make arrangements to send you a trial order of the proper gage, temper, and coating weight.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

the Iron Age

Vol. 174, No. 13, September 23, 1954

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## NEWS DEVELOPMENTS

**TITANIUM: SHAPING A NEW INDUSTRY — P. 65**
Signing of a government contract last week made Electro Metallurgical Co. the fifth firm in the infant titanium industry. Electromet's 7500 ton capacity will bring total planned facilities to 22,500 tons, 15,000 tons short of the GSA goal. Plant to use sodium reduction instead of Kroll process. Titanium Metals plant at Henderson to reach full capacity (3600 tons annually) next week. ODM to set new goal this year. Who's who in titanium industry.

**REBUILD THE FIRST AMERICAN IRON WORKES — P. 68**
Reconstruction of a modern, fully-integrated mill of 1646 has been completed at Saugus, Mass. Called the birthplace of American steel industry, the Iron Workes has been opened as a metalworking museum.

**HOW JUSTICE DEPT. VIEWS MERGER LEGALITY—P. 72**
Asst. Attorney General Barnes tells THE IRON AGE that Justice Dept. will not state whether a planned merger is legal or illegal. But it will study the merger plan and, if it appears to be legal, Justice Dept. will state that it "does not presently intend to take action with respect to the proposed acquisition." Changes in anti-trust laws may be coming.

**JUSTICE DEPT. MAY NIX STEEL MERGER PLAN—P. 73**
Proposed Bethlehem-Youngstown merger has set off rumblings in Anti-Trust Div. of Justice Dept. They could kill the plan. But proponents argue that products of each complement each other and merger would boost competition, not reduce it.

**U. S. DEFENSE MUST MEET TOUGHER COLD WAR—P. 81**
France's rejection of EDC, plus Indo China reverses has given the global cold war a much tougher look. U. S. must take up the slack with greater defense efforts. Ike's plea for Universal Military Training was the initial step. Defense Dept. contracts will be almost doubled, will speed pendulum swing from last winter's recession to an "Economy of Emergency."

**EXPECT NEW PUSH FOR GUARANTEED WAGES — P. 89**
Government officials expect another showdown between management and labor on the guaranteed annual wage. Far from giving up after 1954 reversals, labor leaders seem intent on renewing the fight in 1955.

## IN METALWORKING

### ENGINEERING & PRODUCTION

**STAMPINGS: SHOULD YOU MAKE OR BUY THEM?—P. 107**
The cost of a stamping whether it is made or bought, depends upon how good a buying job is done. If a buying transaction is involved a *make* or *buy* comparison is possible. One important contract metal stamping company has set forth some arguments on this *make* vs *buy* argument. It claims the issue has been clouded by "patterned" thinking.

**ELECTRONIC CONTROLS AID GEAR LAPPING — P. 112**
Versatile, accurate electronic controls replace mechanical camming on new high-production gear lapping machines at one large automotive company. Cam elimination means less downtime for machine readjustment.

**ACCEPTANCE STANDARDS AID PART QUALITY—P. 114**
Magnetic indications produced by inclusions in mild steel and nonstructural parts, though usually not considered defects, may prove to be a deciding factor in service life. A standard method of interpreting magnetic inspection results has been established at a large aircraft plant on the size, quantity and location of inclusions found in various parts.

**HOMOGENEITY IMPROVED BY DOUBLE MELTING—P. 116**
Many advantages are seen for the double melting technique. Production of unalloyed zirconium from sponge by this method will permit a 95 pct recovery in the form of finished ingots free from flaws. Good homogeneity is achieved and forging losses are fewer.

**PLATING MACHINE BRINGS PEAK EFFICIENCY—P. 120**
Increased production demands, plus desire to obtain more consistent, high-quality deposits led to the conversion of a semiautomatic plating setup to a fully automatic one. No handling is required except for loading and unloading, rejects have been cut to less than ½ pct. Some of the equipment was custom-built.

### MARKETS & PRICES

**STEEL STRAPPING BAROMETER READS HIGHER—P. 67**
If the old adage that steel strapping sales are a good business barometer holds true today, then the signs are good. Sales began to pick up last month and the outlook is for the year to come within 10 pct of 1953. Producers see bigger use in steel, nonferrous packaging. Ready new products.

**AUTOMATION NEEDS INTEGRAL GAGING — P. 95**
Unless gages are built into automatic machining lines, automation will merely speed-up production of faulty parts. Gage builders must design precision control instruments inside machines to prevent inaccuracy not merely report it after it has occurred.

**STEEL MILLS HOLDING PRODUCTION GAINS—P. 147**
Steel mill production schedules this week are aimed at holding the gains chalked up last week. Trend of very gradual improvement is expected to continue. New orders continue to gain, though at a very moderate rate. Recent price reductions on bars in the Detroit area are being met by local and out-of-district producers. But lower prices apply only on a limited range of sizes. Other prices are holding firm.

**NON-AUTOMOTIVE USE LIFTS STEEL MARKET — P. 148**
Slight upward look of steel market is not result of automotive buying. Steady production pickup is looked for when automakers re-enter the market. Sheet demand climbs a bit. Oil country is more competitive. September warehouse business somewhat better.

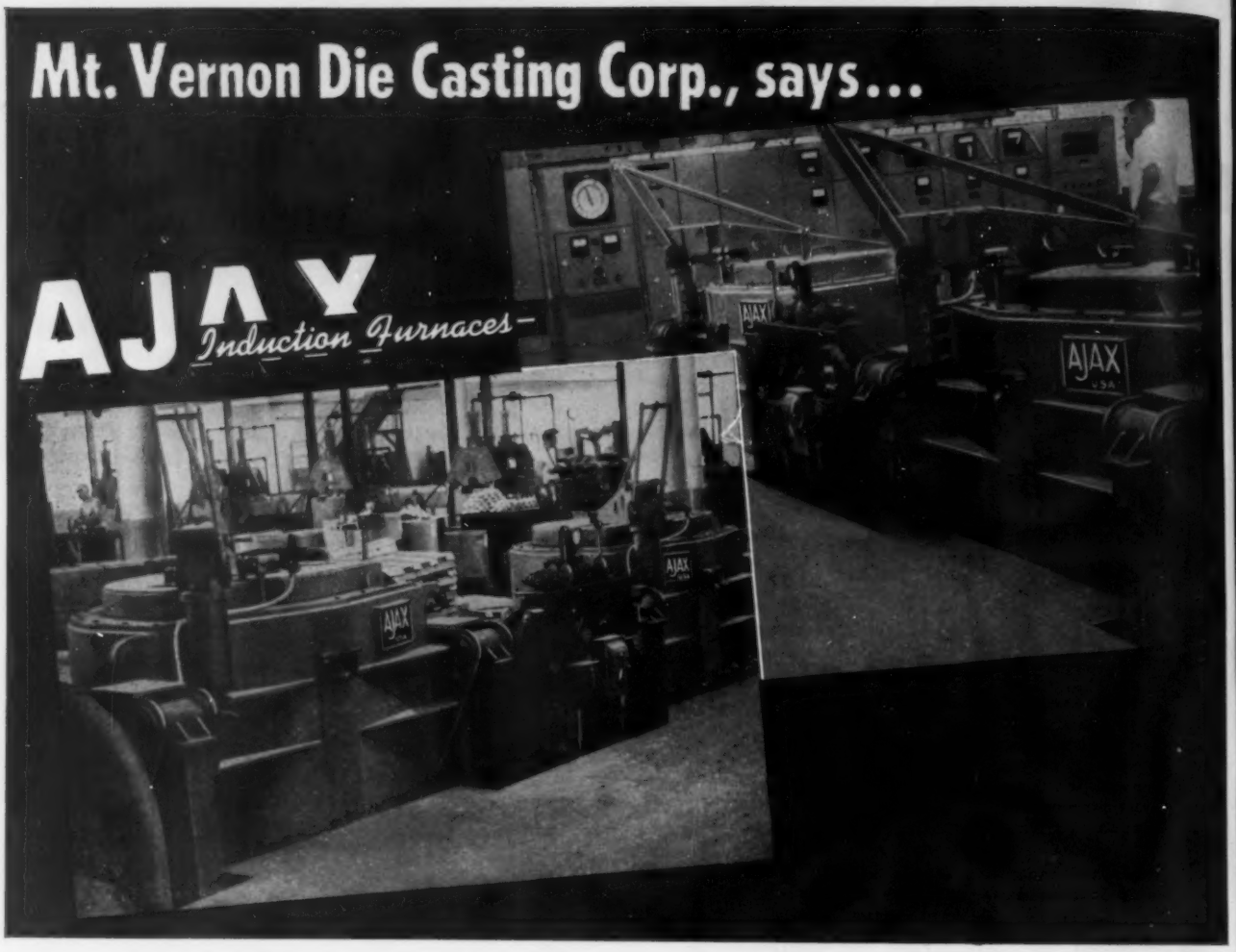
**COPPER STRIKES STILL CUTTING SUPPLY — P. 150**
Labor still held the center of the stage in copper early this week as the domestic situation showed little change. Kennecott says it will go to a 4-day week on Sept. 27 if Utah smelter and refinery workers don't return. In Chile, the government took strong measures to end the mine strikes.

## NEXT WEEK:

**TECHNICAL FEATURE ISSUE ON POWDER METALLURGY**
Powder metallurgy is steadily gaining greater recognition in the metalworking industry as a cost-saving production method. Because of its growing importance to the entire metalworking field, the Powder Metallurgy Issue will contain articles on recent advances in powder metallurgy of major interest to both fabricators and users of powdered metal parts.

**ARTICLES IN THE NEWS AND FEATURE SECTION**
will cover such subjects as: How powder metallurgy can lower production costs; trends in powder press design; production of high-density parts; how to get best results from sintering furnaces; progress in hot coining; plating techniques; and a section devoted to case histories of proven powdered metal parts.

# Mt. Vernon Die Casting Corp., says...




After a most satisfactory experience of more than five years with AJAX *low frequency* Induction Furnaces in their Mt. Vernon, New York plant, this company has now installed the furnaces shown above in their new modern plant at Stamford, Conn. "We are convinced," they state, "that economy of operation makes this type of furnace well worth while. We intend to continue to install them till all our die casting machines are fed by AJAX furnaces."

All ALUMINUM alloy at Mount Vernon is melted in a central group of AJAX melting furnaces. Small individual AJAX holding furnaces serve many ALUMINUM die casting machines.

All ZINC die casting alloy is prepared from pure metals in another group of AJAX melting furnaces. AJAX holding furnaces serving all ZINC die casting machines are supplied through an AJAX-engineered molten ZINC distribution system requiring no labor.

Years of practical experience with AJAX induction equipment enabled Mount Vernon Die Casting Corporation to take full advantage of this up-to-date method of melting in their new plant. The result is outstanding production efficiency and quality control.

We at AJAX Engineering are proud to have played a part in this achievement.

***Write for Reprint of Article Giving Further Details on this Installation***

**AJAX ENGINEERING CORP., TRENTON 7, N. J.**

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AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

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Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

# Editorial:

## Defense Build-Up Is Rolling

THE headlines you saw a week ago about $3 billion being saved on defense spending didn't mean what they seemed to say. Spending in government terms means paying the bill for contracts that were placed a year or a year and a half ago.

If you took close notice of the defense savings you would have found that some were nonrecurring while others represented the postponement of construction that will be started later. The big thing to remember is that what Secretary of the Treasury George Humphrey was talking about had to do with past history—not with the present or the future.

This is an election year. Right or wrong the Administration's decision is not to talk too much about danger spots, increased defense commitments or "amendments" to our foreign policy.

The defense build-up started a few months ago. It will gain bigger momentum later this year. It will involve material for the armed forces, increased aircraft building, a boost in naval power, substantial spending for top secret projects and expanded military aid to other countries.

Basis for such opinion stems from the loss of Indochina, the seriousness in Formosa, the almost certainty of a Universal Military Training program, the need for a revamping of West Germany's strength in Europe and the necessary shoring up of Japan's economy. All this places a bigger burden on us whether we like it or not—and it will cost money.

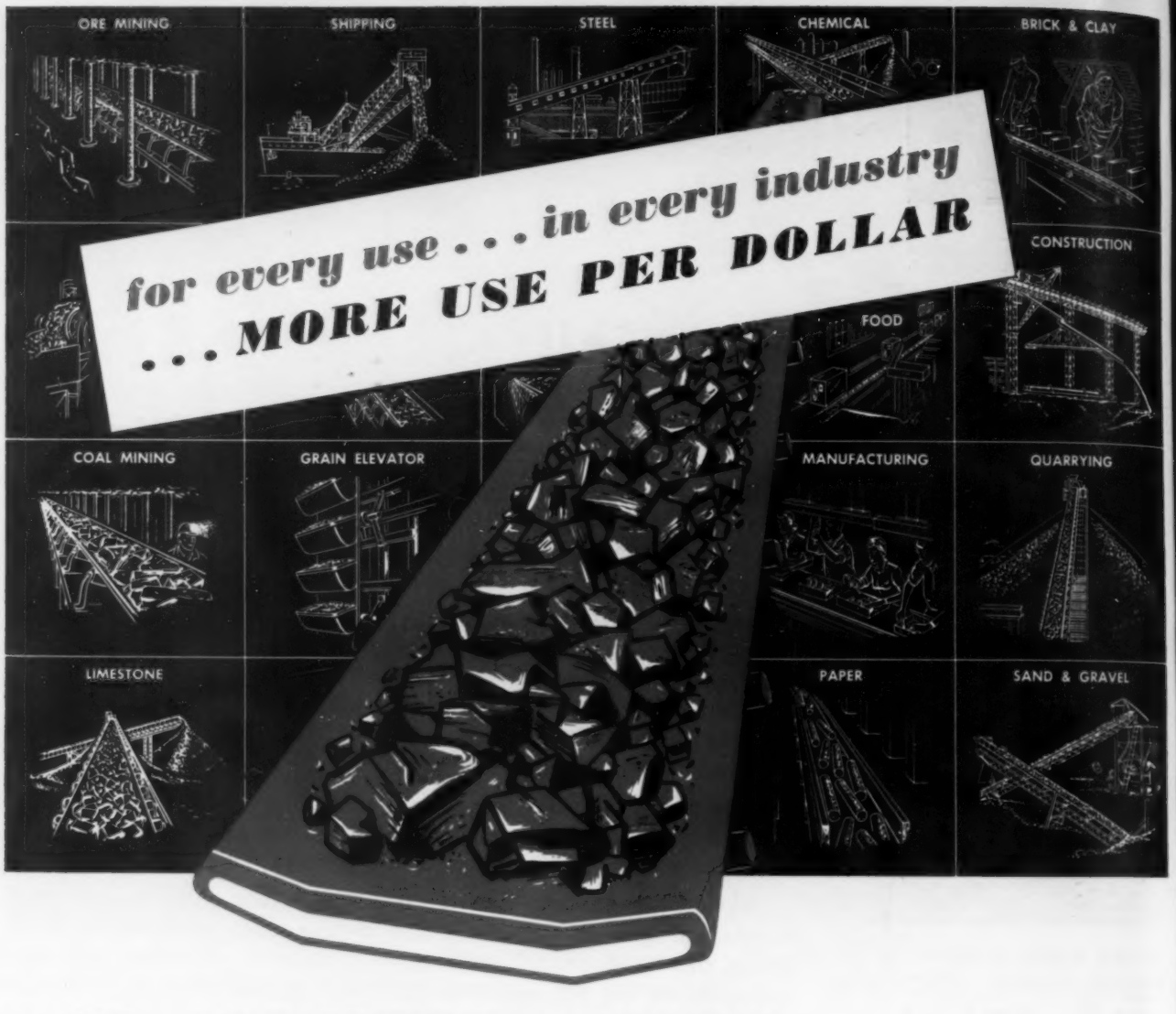
The Southeastern Asia Treaty Organization eventually will be more than sheets of paper. SEATO is admission that the dependence which we once placed upon French possessions and French armed forces is gone.

Some things we must do alone but that does not mean we will "go it alone." While we are in the midst of a global battening down of the hatches we also must keep ahead of the Communists' advances in air power, guided missiles, atom weapons and "conventional" warfare.

Silence from the top indicates that things are stirring behind the scenes. But it might be a good idea to tell the Russians and the Chinese too before they make a few foolhardy blunders.

Tom Campbell

EDITOR




# R/M CONVEYOR BELTS

If conveyor belts are your problem, turn to Raybestos-Manhattan. There are R/M Conveyor Belts with extra cushion for heavy shock loading. R/M Conveyor Belts for mining, quarrying, or bulk materials are unequalled for natural troughing, flexibility and long life. The latest exclusive development of R/M engineers is the "XDC" cover which protects heavy duty conveyor belts against wear, abrasion, cuts and tears to a degree never before attained. Hot material, high tension, long lift, oil or non-spark conditions . . . all are met with special R/M Conveyor Belt designs. Equally good engineering goes into R/M Belts for light duty . . . packages, parts, cases or wood chips. For every use R/M Conveyor Belts give you More Use per Dollar. Consult an R/M representative. Ask him also about R/M Hose, Transmission, V-Belts and other industrial rubber products.

RM

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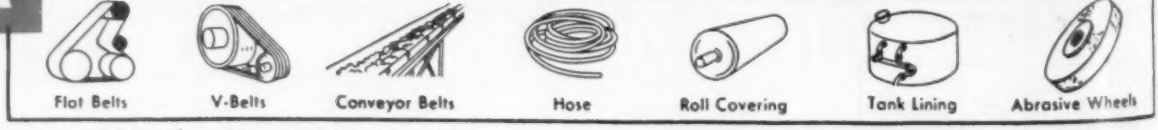


Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
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# dear editor:

*letters from readers*

### Falling Dust

Sir:

In the July 21, 1949 issue there was an article on the dustfall in Chicago pointing out such things as these: That in the first 5 months of 1949, 341 tons of dust per square mile fell on the city of Chicago; and that in the Loop alone, in March, there fell 303 tons of dust per square mile. The article goes on to state that this dustfall was ascertained by the establishment of 25 dust collecting stations around the city.

We would very much like to know if you could tell us the name of the research organization that handled this project; or, failing that, the source of material for the article as reprinted in your magazine. *Thomas Clarke, McCann-Erickson, Inc., San Francisco.*

The Chicago Dust Abatement Dept. established 25 collecting stations to catch dust fall over the city. The Analytical Dept. of Armour Research Foundation of Illinois Institute of Technology measured and clarified the dust collected.—Ed.

### Castable Refractory

Sir:

Can you give us the name of the company that manufactures the castable refractory that withstands 3000°F? This was mentioned in the Newsfront of Aug. 19. *H. H. Lurie, Chief Metallurgist, Cummins Engine Co., Columbus, Ind.*

Details may be obtained from the J. H. France Refractories Co., 1944 France Road, Snow Shoe, Pa.—Ed.

### Storeboxes

Sir:

We note from your issue of Aug. 5 that the price of galvanized steel sheets is keeping steady especially in the Chicago district due to big demands as the material for making storeboxes of agricultural products.

In this connection, we would appreciate it if you could give us any information as to the shape, size and, if possible, a pictorial illustration as well as the names of the manufacturers of the box. We want to find out the possibility of using such boxes by farming houses in Japan. *T. Take, Manager, Osaka Kozai Co., Ltd., Tokyo.*

Additional information on the structures and methods of building them may be obtained from the U. S. Dept. of Agriculture, Washington 25, D. C.—Ed.

### Borides

Sir:

There appeared on pp. 138-139 of the Apr. 1 issue, an article, "Borides Designed For High Temperature Use" by Dr. Paul Schwarzkopf and F. W. Glaser. This article dealt with bonded borides of zirconium, chromium and molybdenum.

I would appreciate any information such as physical properties, size of pieces fabricated, and price of these borides, which you could obtain for me. *E. A. Andrews, Jr., Carbon Products Engineering, Large Motor & Generator Dept., General Electric Co., Schenectady.*

We suggest you contact the authors at the Borolite Corp., 320 Yonkers Ave., Yonkers, N. Y., for this information.—Ed.

### Induction Hardening

Sir:

We have noted with interest in the Aug. 26 issue on p. 93, an article entitled "Induction Hardening Improves Gear Life, Shortens Heat Treating Cycle" by W. L. Walz of the International Harvester Co.

We would very much appreciate receiving five tear sheets of this article at your earliest convenience. *J. M. Edwards, Section Manager, Industrial Equipment Engineering, Electronics Div., Westinghouse Electric Corp., Baltimore.*


What does "S. B." mean to you?

To some, it means Sand Blasting . . . the big blow that gives old buildings that new look. But, to hundreds of industrial designers, it means Small Balls . . . at which Universal is best.

Sure, we make balls from the size of a mustard seed up to that of a walnut, each of them precisioneered for true roundness and silken silence. Write for details.

Universal Ball co.

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MONTGOMERY CO., PA.

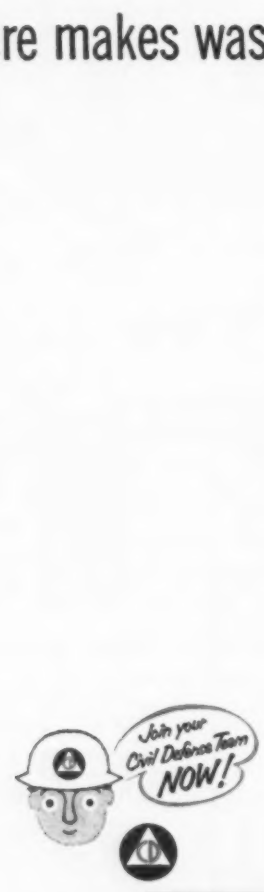
a hole here makes waste...

a hole here makes a saving

***Crucible Hollow Tool Steel Bars*** **are a boon to the metalworking industry. The hole in these quality bars enable toolmakers to eliminate drilling, boring, cutting-off and rough-facing operations. This cuts production time, boosts machine capacity and saves scrap losses.**

**They are available now, in any of Crucible's famous tool steel grades, in almost any combination of O.D. and I.D. sizes. And you can get *immediate* delivery of five popular grades — KETOS oil-hardening, SANDERSON water-hardening, AIRDI 150 high carbon-high chromium, AIRKOOL air-hardening, and NU DIE V hot-work tool steels — from a conveniently located Crucible branch warehouse.**

**Let your Crucible representative show you how these steels can best help *you*.**




**CRUCIBLE** first name in special purpose steels

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## fatigue cracks

*by William M. Coffey, Company Commander*

### Bless our Home

We have the perfect family relationship at our house. Here's a family attending strictly to business according to Army Regulations. There's only one Company Commander, we promise you that. And there's only going to be one Company Commander, at least until a new Table of Organization comes out and you old army people know that never comes out. Here's about the way a typical day starts.

At 0530 one of the children (one of the troops) reports to the kitchen for KP duty. Detailed, of course, on a rotation basis. Duty is to put on the coffee pot. Then must rout out the rest of the troops for physical training. This is led by the Company Commander's wife, the acting 1st Sgt. who puts the troops through a brisk 45 minute session. (Always smart to make all noncoms *acting;* then they'll keep working for the real thing which they might get when the new Table of Organization comes out). The troops are then ordered back to barracks to put on the uniform of the day and pick up cigarette butts. The acting 1st Sgt. assumes the duties of acting Mess Sgt. and reports to the mess hall to prepare the usual garrison breakfast, C Ration on Toast, if the toaster is working, otherwise on bread. There used to be another name for this breakfast, but since the war orders came through to make the new army a gentlemen's army so we don't use that name in our command anymore.

The troops are marched to breakfast. One is detailed to wake up the Company Commander and give him his coffee. The Company Commander looks over the Morning Report, notes any dirty rifles, awols, etc., then strides smartly to the officers' mess (the dining room; troops eat in kitchen), has his ham and plover eggs, toast and marmalade, then strides smartly to the living room where the acting 1st Sgt. has the troops drawn up for a little manual of arms work. The Company Commander personally directs this important business while the acting 1st Sgt. assumes the duties of acting Motor Sgt. and reports to the Motor Pool. The acting Motor Sgt. washes and polishes the Company Commander's car and drives it to the Company Commander's quarters. The acting Motor Sgt. drives the Company Commander to the station where, with one very alert salute the Company Commander orders the acting Motor Sgt. back to quarters for a general policing of the area and detailing of the troops for daily troop information and education sessions.

**TORONTO, Ont.**

**. . . A Royal Canadian Air Force veteran who turned his basement into a parade square and his wife into a draftee today was given 21 days in jail.**

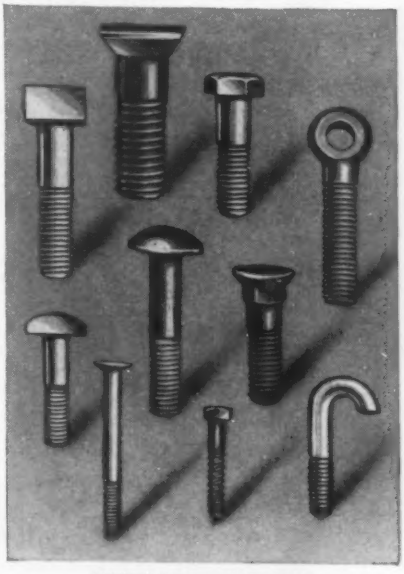
**Mrs. William Bagler said her husband dressed her in pajamas and an RCAF raincoat. Then he filled a pack with bricks and strapped it on her back. Then he forced her to march up and down the basement for pack drill.**

Scandalous attitude on the part of that judge. How the heck would *he* train a draftee?

### Puzzlers

A farmer hires Eustace and Angus to dig a 100 ft ditch. He agrees to pay them $2 per ft or $200 for the job. Since one end of the ditch is in rocky soil and the other end is in sandy soil Eustace and Angus agree that the one starting in the rocky soil will get $2.50 per ft and the one starting in the sandy soil will get $1.50 per ft and that each will dig enough footage to receive $100 (½ the total). How much of the 100 ft ditch will each man dig to receive his $100?

Thanks to Mr. H. O. Eads, Knickerbocker Stamping Company, Parkersburg, W. Va.

Uniform
Class 3 Fit
BOLTS
NUTS
STUDS
TITANIUM
• Carbon Steel
• Alloy Steels
• Stainless Steels
• Silicon Bronze
• Naval Brass
• Monel Metal
You can depend on a uniform Class 3 fit if required when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

BETTER BOLTS SINCE 1882
PAWTUCKET
MANUFACTURING COMPANY
327 Pine St. • Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.
"The Bolt Man"

# STANDARDS and SPECIALS by the Millions

## THE FERRY CAP & SET SCREW CO.

2157 SCRANTON ROAD • • • CLEVELAND 13, OHIO

### "SHINYHEADS"

**America's Best Looking Cap Screw**

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 90,000 p.s.i. Carried in stock.

### "HI-CARBS"

**Heat Treated Black Satin Finish**

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength in accordance with SAE Grade 5. Carried in stock.

### "LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength in accordance with SAE Grade 2. Carried in stock.

### SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

### FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

### FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

### "SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

### ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

### CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

### SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

### FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

***Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907***

**STANDARDS** carried by LEADING DISTRIBUTORS

* **SPECIALS** furnished to BLUE PRINT SPECIFICATIONS

**WRITE FOR INFORMATION**

**SEND FOR SAMPLES**

# The Iron Age Newsfront

### Atomic Power: A Business Takes Form

Practical industrial application of atomic power is beginning to take the shape of a business in which volume and profit potentials are tangible and substantial. One large firm believes the near-term market lies in naval propulsion equipment; the long-range market in central station equipment.

### Look for Some Car Price Cuts

Look for some selective but not universal price cuts on 1955 cars. At least one of the independents has unofficially indicated that it would pare prices as a result of a successful economy drive. Several cars that appear to be overpriced in comparison with competitive makes can be expected to do some adjusting.

### Metal Used to Bond Fiber Glass

Greater resistance to heat and corrosion agents, and improved strength-weight ratios are reported for fiber glass reinforced materials bonded with metallic and other inorganic substances rather than conventional resins and organic materials. Iron, nickel, molybdenum, aluminum, zinc, lead, tin and copper are applied to filaments as the fiber glass is made. Materials are then treated under heat and pressure.

### Alloy Steels for TV Super Towers

Steel and TV engineers are designing super television broadcasting towers around high strength alloy steels. Engineers are thinking in terms of towers 2000 ft high and over compared with present limits of around 1200 ft. Super towers are needed to reach so-called "dead" reception areas. High strength steels would mean lighter sections, reducing overall weight and minimizing wind problem.

### Flux For Low Temperature Joining

Improved joint strength is reported with a new type reaction flux developed for low temperature joining of aluminum, copper, titanium, zirconium, zinc, tin, silver, and jewelry alloys. All types of joints including tee, butt and lap have been satisfactorily made with the new flux.

### British Need Engineers Too

Shortage of good engineering talent is not confined to this country. British reports indicate recruitment of engineers is falling short in both quantity and quality. Management also feels professional engineers must broaden their outlook to avoid losing representation at top levels of management.

### Checks Hydrogen In Titanium

Critical effects of small concentrations of hydrogen in titanium and titanium alloys have caused titanium producers and users plenty of headaches. Now one company has developed equipment which can rapidly determine hydrogen content in titanium metals within a narrow range.

### "Cut Cost" Appeal Brings Results

A contemplated price increase by one equipment producer was axed promptly as the result of an unusual and successful appeal to the firm's vendors. Faced with an extremely competitive market, the firm asked 1000 vendors to review costs, cut waste, and, if possible, pass on savings. This, the producer argued, would help hold the price line on the finished product in a more highly competitive market. Reward: Promise of continued high or higher sales volume, and eventual purchase of more raw materials.

### May Use High Head Furnace

One American producer of alloy steels is considering high-head furnace heating of slabs and billets for rolling. This heating principle makes use of a high temperature differential between the heating chamber and work. Rapid heat transfer, compactness, less scale, labor savings, and greater flexibility are advantages claimed.

### Bombers Cleaned With Steam

One aircraft builder is saving money in clearing dirt from rivet heads and seams on exterior surfaces of new bombers. Partial wipe-down with a solvent is followed by steam cleaning and application of a corrosion resistant coating.

# NEW AIR-BREAK STARTER for 2,200 to 5,000 Volt Motors features 50,000 KVA Capacity

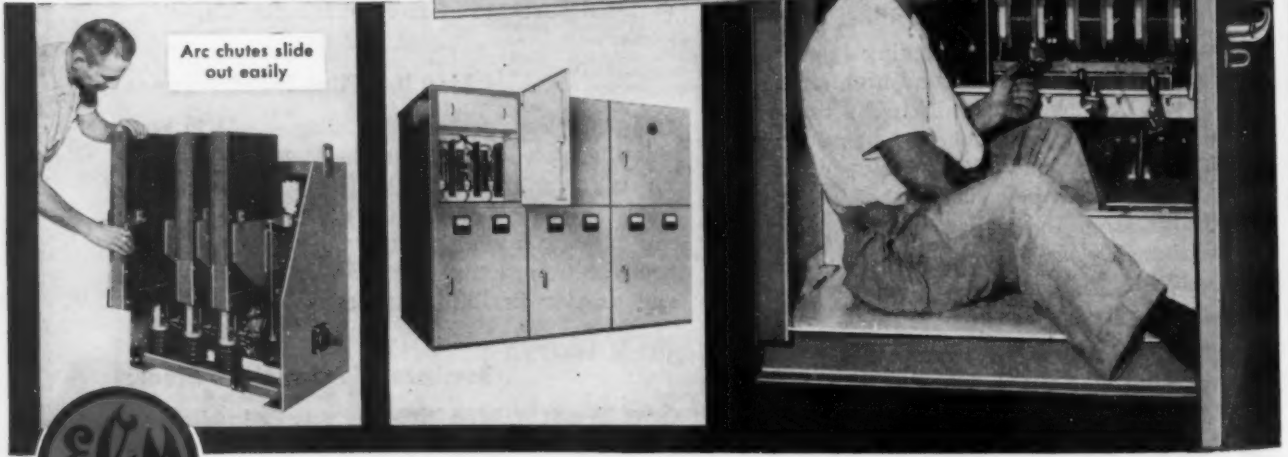
# CERTIFIED

## FOR FANS, PUMPS, COMPRESSORS, CONVEYORS, CRUSHERS, AIR CONDITIONING UNITS, MILL MACHINERY

Designed for a wide range of applications, this new EC&M type ZHA Air-Break Motor Starter utilizes magnetic contactors having(certified)50,000 kva interrupting capacity. For circuits of higher fault capabilities, Volt-Ampere-Limitor (VALIMITOR) Starters, with air-core reactors, limit infinite available kva to a low finite value for interruption by the ZHA Contactor.

These new 50,000 kva and Volt-Ampere-Limitor (VALIMITOR) Starters are available in a wide range of sizes for squirrel-cage and synchronous motors as well as for wound-rotor motors. Starters can be furnished in standard, gasketed and weather-resistant enclosures.

*Write today for Catalog No. 1060*

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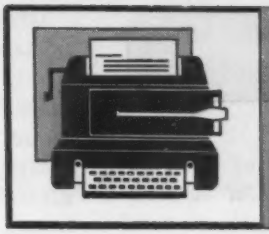
**THE ELECTRIC CONTROLLER & MANUFACTURING COMPANY**

2698 EAST 79th STREET • CLEVELAND 4, OHIO



NEWS SECTION

Special Report

# TITANIUM: Shaping A New Industry

**The "wonder" metal faces dilemma of continuing development and volume production . . . Government incentives encouraging private industry to research, expand . . . Electromet starts big—*By R. L. Hatschek.***

♦ LATEST company to jump into the titanium picture is Electro Metallurgical Co. with the signing last week of a government contract which will result in a plant of "at least" 7500 tons annual capacity. General Services Administration guarantees to purchase from the Union Carbide & Carbon Corp. subsidiary all unsold metal up to 7500 tons a year at the going market price.

This brings to five the number of firms with GSA procurement contracts and it brings total projected sponge capacity to 22,500 tons. Electromet's current plans call for the marketing of sponge only, not ingot or mill products.

### Yields Good Quality

Construction work on the plant, to be located at Ashtabula, Ohio, will begin at once. It will be the first to produce titanium commercially by a process other than the Kroll method. Titanium tetrachloride will be reduced by sodium in the Electromet process rather than by magnesium.

This is claimed to yield metal of exceptionally good quality. While no statements are made on production costs, it should be noted that the GSA contract is for metal at "prevailing market prices"—not at a guaranteed minimum price.

The firm is also highly noncommital on details of the "high quality," though the metal will apparently meet government specifications. These specs call for sponge with a Brinell hardness of under 160. Reports are that Electromet has produced quantities in its Niagara Falls pilot plant with Brinell hardness under 120. This metal, naturally enough, contains no magnesium chloride, is extremely low in iron and apparently compares well with Kroll process titanium on oxygen, nitrogen and hydrogen content.

### Others Expand

While Electromet will follow trade practice and call its product "sponge," titanium produced by this process is more crystalline than Kroll metal. It is a powder of approximately 40 mesh which is said to be easily compactable into electrodes.

Initial production from the privately-financed plant is expected in 1½ to 2 years with full capacity output about a year later.

Elsewhere in the titanium scene, Titanium Metals Corp. of America will hit full stride at Henderson, Nev., in about a week. This brings capacity there to 3600 tons annually and, together with

## Who's Who in Titanium

Titanium Sponge Capacity—Present and Proposed

| Company | Plant Location | Present Annual Capacity | Proposed Annual Capacity | Completion Date or Schedule | Production Process |
|---|---|---|---|---|---|
| E. I. du Pont de Nemours & Co. | Newport, Del. | 3600 tons | 3600 tons | Apr. '54 | Kroll |
| Titanium Metals Corp. of America | Henderson, Nev. | 3600 tons | 3600 tons | Oct. '54 | Kroll |
| Electro Metallurgical Co. | Ashtabula, Ohio | Pilot Plant at Niagara Falls, N. Y. | At least 7500 tons | Start in 1½ to 2 years, full output 1 yr later | Sodium reduction of titanium tetrachloride |
| Cramet, Inc. | Chattanooga, Tenn. | Pilot Plant at Chicago | 6000 tons | Start in late '54 | Kroll |
| Dow Chemical Co. | Midland, Mich. | Pilot Plant | 1800 tons | Start Jan. '56, full output July '58 | Magnesium reduction (Kroll) |
| Horizons Titanium Co. | Stamford, Conn. | ..... | Pilot Plant | Mid '55 | Electrolysis of potassium titanium fluoride |
| Western Pyromet Co. | Manteca, Calif. | ..... | Ultimately 6000 tons | ..... | Modified Kroll |

the 3600-ton capacity of E. I. duPont de Nemours & Co. at Newport, Del, brings the U. S. total to 7200 tons of commercial facilities. This is exclusive of limited production from the several pilot plants currently in operation by other firms and the government.

### More Firms Interested

Before the year is over other new capacity will be brought in at Chattanooga, Tenn., by Cramet. This plant, when up to full operation, will be able to produce 6000 tons yearly. Only other firm currently holding a GSA production contract is Dow Chemical Co., which is scheduled to start production at Midland, Mich., in January 1956. Full capacity of 1800 tons should be reached by July 1956.

The government's interim goal of 37,500 tons capacity by 1956 is 15,000 tons short of fulfillment and GSA is still talking contracts with several other companies. The agency, however, prefers not to disclose their identity as yet. But it is known that practically every major chemical concern, several nonferrous metal producers and a number of research firms have shown definite interest. Some are already either building or operating pilot plants.

Office of Defense Mobilization is expected to establish firm capacity goals in the next 60 to 90 days. Just how large this goal will be or what target date will be established is unknown. Military aircraft alone could use 150,000 tons a year right now, defense officials say. And should a shooting war develop the need would be much higher. Army Ordnance and the Navy would also like to use considerable quantities of the metal if the price were lower.

But any expansion made on the basis of current production methods faces the possibility of becoming suddenly obsolete. Many firms are working on the problem of a cheaper, continuous production method. Some have already produced metal either in laboratory or pilot plant quantities. If the bugs can be eliminated, the Kroll process could go out the window.

### Who Melts, Rolls

One firm, Horizons Titanium Co., has a government experimental contract under which it is to build a pilot plant at Stamford, Conn. This plant is scheduled to go into operation about mid-1955. Heart of the Horizons process is electrolysis of potassium titanium fluoride.

Then there's still the job of converting sponge to usable mill products. At present there are four firms in this business: Titanium Metals Corp.; Mallory-Sharon Titanium Co.; Rem-Cru Titanium, Inc.; and Republic Steel Corp. All of them remelt sponge to produce ingot, then further fabricate it into mill products. Titanium Metals uses its own sponge and has none left to sell. All the others depend on duPont for their sponge.

### Boost Melting, Finishing

Certificates of Necessity have recently been granted to Rem-Cru and Mallory-Sharon in GSA's parallel goal of 37,500 tons of titanium, melting and fabricating capacity. Just what this will mean is difficult to pin down as furnace capacity depends on length of work week and number of shifts operated daily.

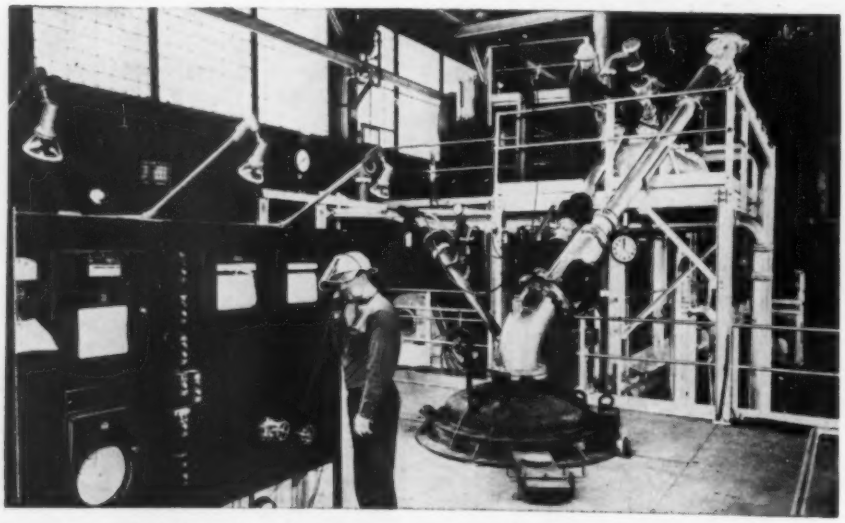
But melting and finishing facilities can be more readily expanded than sponge production.

At present there are no mills designed specifically for titanium rolling. Producers all use stainless steel mills with little more than a roll change. It's likely that any new equipment for titanium will be much the same, modified only to facilitate the shift from stainless to titanium.

### 3000-Ton Stockpile

High prices—almost $5 per lb for sponge and about $20 per lb for sheet—are currently holding back commercial applications. Titanium is only worthwhile today for special civilian uses such as commercial aircraft and some chemical industry equipment.

Production this year is expected to total something over 5000 tons, compared to 2241 tons in 1953. And the government expects it will have accumulated a strategic stockpile of about 8000 tons by year end.



SODIUM REDUCTION of titanium was tested in this pilot plant of Electro Metallurgical Co. Will be first commercial departure from Kroll method.

## South's Metal Men Meet

Diversification of the Metalworking Southeast was the theme of last week's Southern Metals Conference in Atlanta. Sponsored by a number of southern chapters of the American Society for Metals, the meeting brought together many of the South's top rank of metalworking men. Discussions covered current practical developments being used in southern plants.

# STRAPPING: Sales Barometer Climbs

**First half sales about 10 pct under first half '53 . . . Volume rises in August . . . Strapping equipment sales rise also . . . See bigger use in steel, nonferrous—*By K. M. Bennett.***

♦ IN THE not-distant past, before the advent of the staff economist armed with batteries of charts and indexes, many sales chiefs regarded steel strapping as a fairly reliable rule-of-thumb barometer of the tempo of business generally.

If the old adage holds, then the signs are good. The steel strapping barometer began moving up in August. The progress has been slow, but last week steel strapping producers were beginning to talk of a net that would run conservatively within 7 pct of last year's healthy sales, and a gross tonnage that would run only about 10 pct short.

"If you'd have asked me yesterday morning, I'd have been pretty pessimistic," commented a veteran sales chief. "I've changed that quick, even after the August pickup. Right now, we're going to have to push but we will hit close to last year's figure. With all the stops out, we could equal it."

### August Tempo Speeded

No bonanza market, but a healthy one, steel strapping sales for the industry have been running about 10 pct below the same period last year in the first half 1954. Fiscal 1953 was a good year. While many industries began drifting downward after August of last year, steel strapping sales maintained a sturdy average through December, and it wasn't until January that sales of the packaging material began to drag their feet.

With August of 1954, the tempo quickened. Last week there was some early smiling, and while capital equipment generally has sagged through mid-1954, sales of strapping equipment — the machines that fix steel packaging straps around the consumers' goods—continued to move at about the strapping level. The consumer, anxious to cut costs in the toughest competitive year since 1950, was packaging with steel strapping. Sales of powered strapping equipment were particularly healthy.

### Many Growth Possibilities

Barometer or not, steel strapping for packages covers a good segment of civilian output. From baby chicks through baby clothes to oranges and steel sheet — steel strapping holds the bundle together. Publishers' output and the textile industries have been bulk users to date, with lumber, metals, automotive, and the chemical industry all strong comers.

SPIRAL wrapping and labeling of steel strapping at Acme Steel Co.

To continue the upcurve that one producer has plotted through 1965, steel strapping can be expected to move strongly for additional tonnage to home building materials, steel mill use, paper raw materials, and packaging of nonferrous metals.

Use of the metal strap by the steel and nonferrous metals industries is big at present, slated to grow bigger with the adoption of automated strapping units. Pilot models have already been tested, particularly for steel mill use.

Total usage by the basic steel industry of steel strapping to bundle sheet, tinplate, and galvanized isn't yet realized. It's already big enough for one user to comment, however, that he felt his overall sales decline was due in a large part to the reduced tonnages he was shipping to steel mills using strap packaging.

### New Developments Coming

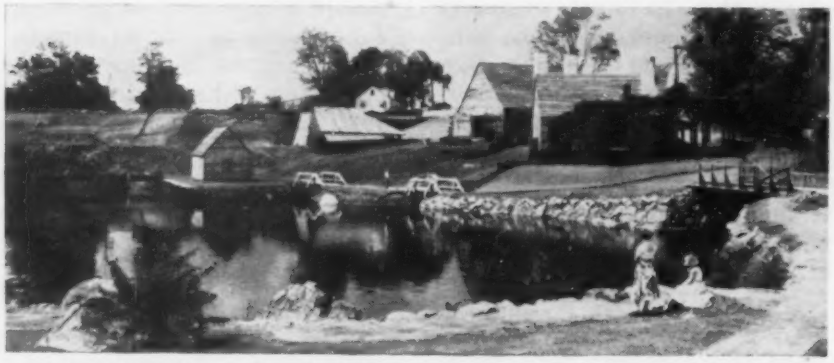
More strapped bundles of brick are a hopeful for 1955. So is steel strapping for confining shipments of aluminum ingot, lead, and zinc. Lumber will be another attractive market, despite the widespread use of strapping there already, and strap producers will be closely watching the Retail Lumbermen's Assn. meeting in New York in October, which will feature the use of steel strapping in more economic handling of lumber.

Despite announcements by such producers as Gerrard, Signode, Acme and Stanley in the past year, the design forces are working on new secret sales weapons. One producer confided that he has at least four ideas working "for announcement later."

INDUSTRIALIZATION

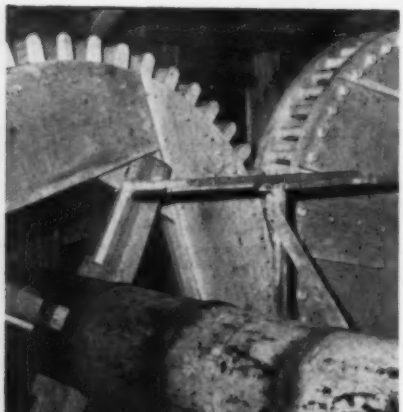
# IRON: Rebuild Colonial Plant

**Open reconstructed Saugus Iron Workes . . . First successful American iron producer was seed for today's giant industry . . . Was fully integrated, modern in 1646.**

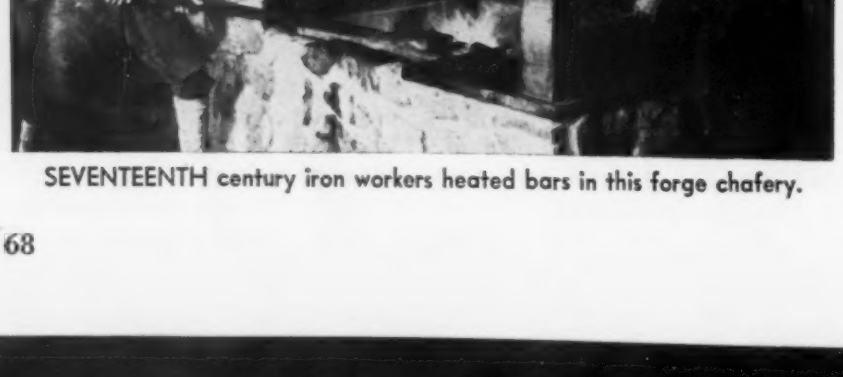


BIRTHPLACE of American steel industry as it looked about 300 years ago.

FOUR-POINT cam (background) lifted, dropped 505-lb forge hammer.



WATER-powered wooden gears turned wooden shaft of slitting mill.



SEVENTEENTH century iron workers heated bars in this forge chafery.

◆ SAUGUS—site of the first successful ironworks in America—was the scene last Friday of an impressive ceremony formally opening the restored birthplace of the American iron and steel industry.

An audience of some 1500 heard comments by Massachusetts Gov. Christian A. Herter, Inland Steel Co. executive committee chairman Edward L. Ryerson, Sen. Leverett Saltonstall, and First Iron Works Assn. president J. Sanger Attwill. Program chairman was Benjamin F. Fairless, board chairman of U. S. Steel Corp.

Restoration required years of research and reconstruction, which was sponsored by the First Iron Works Assn. and financed by the iron and steel industry. Cost was more than $1.5 million.

Dating back to 1646, the colonial ironworks is located 10 miles north of Boston, about halfway to Salem. At the time, these were the two largest settlements and major markets for Saugus iron. Ample raw materials were available nearby—bog iron ore and forests to supply charcoal. Terrain was well suited for top charging the blast furnace and the Saugus River provided both transportation and water power. It was a good site.

### Was Fully Integrated

A London group, the Company of Undertakers for the Iron Workes in New England, was formed to finance the project. Starting capital of 1000 pounds sterling was boosted by later investments to about 15,000 pounds —about $165,000 in today's money.

The "Iron Workes" was a completely integrated and up-to-date operation in its time. It consisted of a stone blast furnace, finery and chafery forges, a rolling and slitting mill, charcoal, ore and finished iron storage facilities, a wharf, the Ironmaster's house, a farm with barn and outbuildings, and a number of cottages for the workers. Only about a dozen rolling and slitting mills existed in the entire world at that time.

Blast furnace was operated about 30 weeks annually, produced just over a ton of iron daily. This iron was then either made into finished cast iron products such as pots and

firebacks or "semi-finished" sows and pigs. Sows and pigs were converted into wrought iron and forged into bars. Some of the bars were then further rolled and slit to produce flats and rods. The rods were in high demand as a raw material for "do-it-yourself" nail making by local farmers.

Prices charged were about $200 per ton for cast iron, $275 a ton for wrought iron. Some sales were made f.o.b. mill; in other cases the products were hauled by cart or boat to nearby towns; and some were shipped to a central warehouse in Boston for local sale or overseas shipment.

### Got First Patent

Total employment of skilled and unskilled, part-time and full-time workers was about 80. Working day was 12 hours and the average wage was relatively high for that period —about 12¢ per hour. Skilled workers were imported from England while local farmers did much of the unskilled work on a part-time basis.

America's first mechanical patent went to a Saugus employee in 1646; Joseph Jenks was granted exclusive privilege for 14 years for "the manufacture of engines of mils to goe by water."

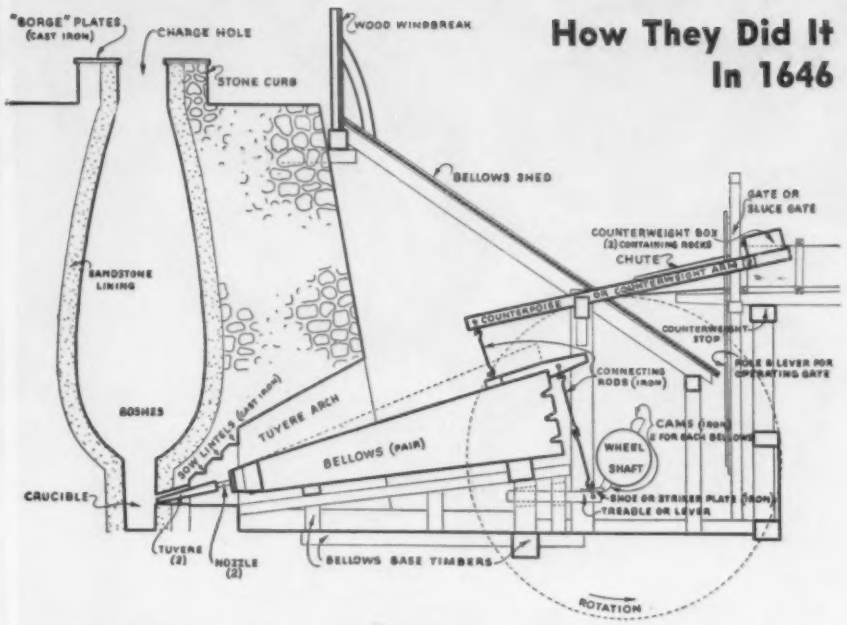
While Saugus ran into trouble, skilled men trained at the ironworks migrated. New ironworks rose at Concord, Rowley, Taunton, New Haven and Providence.

Difficulties included mismanagement, dwindling raw material supplies, competition from imports, conflicts with local authorities and labor trouble (it was hard to hold skilled men when farm land was cheap). The combination was too much and the ironworks was abandoned about 1670.

### Was Treasure Hunt

The detective story and archeological treasure hunt necessary for authentic restoration of the mill provide many more stories. Over 5 tons of artifacts were taken from the excavation. They ranged from brass pins to the original 505-lb iron hammer head from the forge. One important find was the remains of the water wheel which powered the blast furnace bellows —21 ft below the surface of a main street.

## How They Did It In 1646




CAM-OPERATED blast furnace bellows were powered by water wheel.

BLAST FURNACE was top charged from bridge. Note rock-filled boxes which reopened bellows. Many of stones had been used in original furnace.

LEATHER bellows operated alternately by cams visible on shaft at right.

# Communists:

## Rule Mine, Mill Union Communist dominated; charge fraud.

Maurice Travis, secretary-treasurer of the International Union of Mine, Mill and Smelter Workers —a union ousted by the CIO in 1950 as Red dominated—admittedly filed false non-Communist affidavits, a National Labor Relations Board trial examiner rules.

Trial Examiner George A. Downing also finds that the Union membership was aware that seven non-Communist affidavits filed by Travis were fraudulent.

### Still Supported Party

Full NLRB will consider findings of the examiner within about a month. Possible penalty could be denial of bargaining rights to the union, and an election at which another union could be certified. The Board has in the past, however, given union memberships a chance to purge Red leaders.

Travis filed a non-Red affidavit in 1949, but subsequently published a lengthy statement in the union's official national newspaper stating that he had "resigned from the Communist Party to make it possible for him to execute his affidavit of compliance (with NLRB rules), but he nevertheless continued to believe in the principles of Communism and the Communist Party."

The examiner found that he later admitted that six other such affidavits were false, and that he had never altered his allegiance to the Communist Party. The examiner also said that the five-man steering committee of the Union was Communist.

Leschen engineers tell you how to determine . . .

## Proper Use of Wire Rope with Wire Rope Core

**What is it?** It is a completely metallic rope made with a separate wire rope as a core, instead of the usual fiber core.

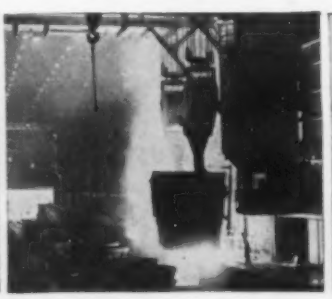
**Why is it used?** The steel core resists extreme pressure of individual strands on the core under very heavy loads. Here, a Red-Strand steel core rope substantially outlasts a fiber core rope. The extra steel in the core increases rope strength and safety by 7½%, compared with wire rope with fiber core. For occasional heavier loads this eliminates time and expense of changing sheaves, blocks and equipment to suit a bigger fiber core rope.

Red-Strand steel core rope answers the problem of crushing when rope is spooled in multiple layers on small diameter drums and winches—or when heavy loads are dragged or pulled. It also resists the damaging effects of excessive heat.

**Where is it used?** For extra strength and to resist heavy load pressure: on shovel and draglines—for drag, hoist, crowd and frequently boom ropes; on dredges, trench hoes, cranes and similar heavy duty equipment. To resist crushing: on bulldozers, scrapers, coal cutters, coal loaders, logging, arch and choker lines, and on rotary drilling lines. To resist excessive heat: on hot ladle cranes.

**Which make should you use?** Red-Strand steel core wire rope is highly recommended by its users for its higher-than-rated quality and longer-than-expected service. That saves money.

**What's the next step?** Talk to your Leschen distributor or Leschen field man. They're well qualified to answer your specific questions about Red-Strand steel core wire rope—or to help solve other wire rope problems.



Severe stress, pressure and crushing occur on rotary drilling drums, winches, shovels, draglines, logging lines, and others. Where tons of molten steel are to be lifted by wire rope, great strength and resistance to intense heat are required. Here Hercules Flattened Strand wire rope with wire rope core delivers much-longer-than-expected service.

Hercules Red-Strand wire rope made by
LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY INC.)
St. Louis 12, Missouri

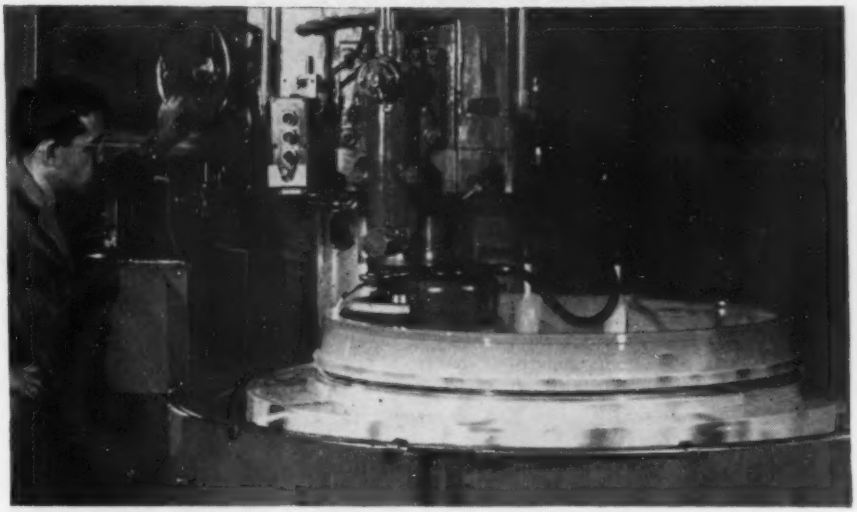
# GRINDING: Incentives Up Accuracy

**Timken boosts output, quality on bearing race grinding by incentive pay . . . Workers must be within prescribed time range to earn top bonuses . . . Develop optimum grinding speeds—By *T. M. Rohan.***

◆ HOW DO YOU keep grinding shop output up on expensive tapered bearing races when overcautious operators take it slower than necessary to keep from ruining parts?

Timken Roller Bearing Co. of Canton, O., has for the past year and a half been getting good results with an incentive system for grinding operators. Output was increased "substantially," workers' wages have gone up and scrap loss has been nil.

Forged bearing cones and outer races ranging up to 72 in. OD are worth up to $1500 by the time they are ready for grinding at Timken. Excessive grinding speed can damage the piece, usually resulting in a product that can't pass inspection and must be scrapped.



INTERNAL grinding of bearing part at Timken Roller Bearing Co., Canton, O.

### Pay For Accuracy

Timken engineers worked out a system for each bearing giving optimum grinding time to remove the required amount of stock. Each bearing part brought to the grinding machine now carries a card with grinding time worked out. If the operator hits it on the nose, or within the prescribed range, he gets a bonus.

If he does it in less or more than the stipulated time range, maximum incentive rate is not paid—assumption being he has ground too fast or heavy. Thus all incentive is removed for grinding too hard or fast to do the work more quickly.

### Find Optimum Speeds

"Times out" which previously tended to make the operator use short cuts to recover lost time are recorded on a Chronolog operated by the floor timekeeper at the operator's summons. Timekeepers also record start and finish of grinding and downtime is deducted. Classifications for downtime are lack of stock, absence of operator, changing pieces, personal reasons, minor adjustments, changing grinding wheel and machine repairs.

Heart of the system, of course, was development of data on optimum grinding speeds supplementing highly skilled grinding operators' practice. Exhaustive tests were made using pull-on motors driving converted vertical boring machines as an indicator of pressure and speed.

### How It Figures

Originally a warning device was planned which would trip when pull became excessive. Engineers found, however, that the machine was limited in amount of power it could pull and damage was still possible if operator applied too much pressure even for short periods. The constant finally established was in terms of inches per minute per thousandths of inch stock removal. Formula evolved is:

Base OD x race length x Pi x grinding rate equals grinding time. Stock removal time is established for different cuts on different sized pieces.

### Quality Stays Up

Since start of the new method in April 1953, not a single bearing part has been lost to scrap as a result of faulty grinding. Extreme overhesitancy and overcaution by operators has been replaced by confidence. Although they are still ultimately responsible, reliance on their own experience, skill and judgment has now been supplemented by accurate measurement, making work conditions easier.

Timken engineers feel maximum output is now being turned out with no sacrifice in quality for increased quantity. Although difficult to substantiate, quality and consistency have probably been improved through absence of heavier-than-necessary grinding for a good showing with other operators.

*The Iron Age* INTERVIEWS:

## Judge Stanley Barnes

# When Is a Merger Legal?

**Justice Dept. won't say if a proposed merger is illegal . . . But it will study the case and if move seems legal it will state it does not intend immediate antitrust action.**

*Q. Will the Justice Dept. tell a firm whether a planned merger is legal or illegal?*

A. No, but any proposed plan of merger that is submitted will be examined and, if it appears to follow the law, the parties will be advised as follows:

"It is the policy of the Department to consider the facts submitted by the parties involved concerning a proposed acquisition and to indicate whether it would take action under the antitrust laws with regard thereto.

"On the basis of the information submitted in the matter and the representations of the parties involved, the Department does not presently intend to take action with respect to the proposed acquisition. It is understood, however, that the Department reserves the right to take action in the future if other evidence or subsequent developments should warrant it."

*Q. Is the Department currently discussing any mergers with firms?*

A. Yes.

*Q. Which companies are involved?*

A. Confidential.

*Q. What are the issues?*

A. Complicated and confidential.

*Q. Will you comment on reports that Bethlehem Steel and Youngstown Sheet & Tube plan to merge?*

A. No comment.

*Q. What is the general feeling of the Department regarding the recent merger trend? Is it really a trend?*

A. Yes.

*Q. Is it generally good or bad for the nation's economy?*

A. The answer depends entirely on the facts of each case.

*Q. Is a reappraisal of the Department's antitrust policy underway or coming soon?*

A. A study of antitrust laws generally is being made by the Attorney General's National Committee to Study the Antitrust Laws, and the Attorney General will take such action on the recommendation of the committee as he sees fit.

*Q. Are there any general rules industry may follow in setting up a merger to increase the chances that it will be legal?*

A. Sometimes conferences with the Dept. of Justice prior to mergers will aid in highlighting the problems that might be involved. Some of these problems might thereafter be eliminated.

*Q. Is bigness itself a sign of illegality?*

A. No.

*Q. How does the Department feel about suggestions that the antitrust laws be made to apply to labor unions?*

A. The Attorney General's committee is studying this.

Stanley Barnes,
Asst. Attorney General

*Q. What is the penalty for violating the antitrust laws?*

A. Maximum penalties for a criminal violation are a $5000 fine and one year imprisonment for each offense. Also, civil penalties may be obtained in the nature of injunctive relief for the purpose of dissipating the effects of the illegal activities.

*Q. What happens to the original corporations which merged if they are found in violation of the antitrust laws?*

A. If a merger violates the antitrust laws, the Court might order the merger dissolved, or take other necessary action.

*Q. Is it possible for several small firms in a huge industry to merge and be found in violation of the antitrust laws?*

A. Yes, it is possible. This would depend upon the makeup of the particular industry. One important factor, for example, would be the number and size of the remaining firms in the industry.

*Q. Is the Department planning to ask for any amendment in the antitrust laws at the next session of Congress?*

A. This will largely be influenced by the recommendations made to and approved by the Attorney General.

*Q. Are mergers to secure diversification of a firm illegal?*

A. Not necessarily.

# STEEL: Justice Dept. May Nix Merger

**Proposed Bethlehem-Youngstown merger sets off trust-buster rumblings . . . Some feel it would cut competition . . . Argue firms' products complement each others' . . . Decision goes to top—*By R. M. Stroupe***

◆ FLICKERING and threatening to flame up is the spark of Justice Dept. discontent caused by plans for mergers in the iron and steel industry and other business fields.

This week the projected joining of Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. is exposed to the heat being generated in the Justice Dept. Anti-Trust Div. Possible result of this torrid situation might be government disapproval of efforts to combine the second and the sixth largest steelmakers.

At the same time, certain factors can be counted as reassuring to the companies themselves. Justice Dept. did not, for instance, go to war over the uniting of Studebaker and Packard for car production. As has been pointed out in the Anti-Trust Div., the products of these latter concerns were deemed to complement each other.

### Send Question to Top

The same case can be made for items turned out by Bethlehem and Youngstown. This gives the companies one more reason for asking that a consistent government stand be taken on mergers.

Late last week there was no certainty as to when the official federal decision would be reached. The matter was known to be under consideration at the highest levels, but word on decisive action was not forthcoming from either Justice Dept. or Denver, where President Eisenhower is vacationing.

In New York, President A. B. Homer of Bethlehem denied a published report that Justice Dept. had already made up its mind. His company, Mr. Homer said, was still supplying requested information to the agency late in the week.

Entering into official appraisal of Bethlehem-Youngstown plans is the question of possible effects of a merger on competition. One argument, not necessarily persuasive, is that the joining of these two highly-placed companies would cut down the race for markets and give the industry a monopolistic tinge.

### Would Bolster Competition

This view is countered by the well-founded contention that if the two concerns combine, their annual ingot capacity will still be substantially less than that of U. S. Steel Corp. But they would be in better position to compete for a larger share of sales in all market areas.

With facilities operating in the Midwest, the East and the West Coast, the new team could be expected to make the most of its geographical advantages by offering products in areas where competitors now have the inside track. This action, it is being pointed out to Justice Dept., would bolster competition, rather than suppress it.

Confronted by these conflicting ideas, federal officials are taking their time in reaching conclusions on what should be done about the planned amalgamation. In asking for further data from Bethlehem, Justice Dept. indicated that the problem has too much national significance to be decided anywhere except in the highest government circles.

Bethlehem obviously is not downcast because of the possibility of a turndown on its merger efforts. Having sought a Justice Dept. opinion and supplied the information desired, the company is adhering to the position that plenty of hope remains for sanction of its proposed action.

G. A. PRICE, Westinghouse head, sees upturn coming.

## Business:

**Westinghouse head reports order upturn; predicts more gains.**

New orders received by Westinghouse Electric Corp. during July and August showed increases over June figures, thus reversing the downtrend of the first 6 months, president Gwilym A. Price told New York security analysists last week.

"We believe that total bookings for the year will not be off much more than the 6 pct we had esti-

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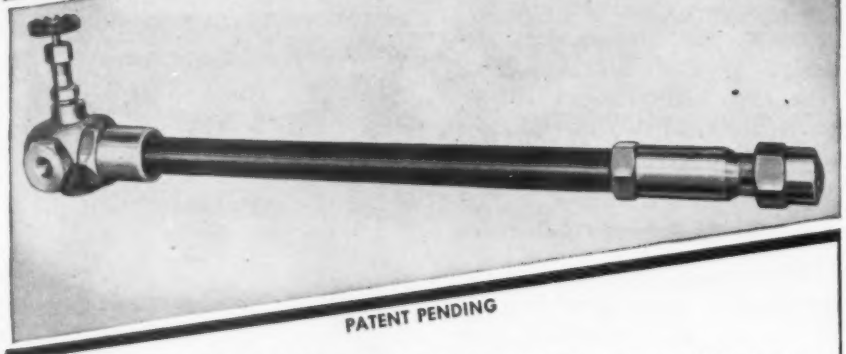

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mated at the start of 1954," he added.

He said he is still hopeful his company can surpass its sales volume for 1953 despite the fact that it set its fourth consecutive annual sales record last year. He is also optimistic on the outlook for 1955 and '56.

Defense products were singled out for a particularly bullish appraisal: "We have a firm expectation that, barring cutbacks or unexpected rescheduling, the level of defense billings during 1955 and '56 will substantially exceed the level of 1954," he said.

Based on facilities in existence or planned, Mr. Price expects his company's normal output capacity by 1957 will be about $2.1 billion in terms of current prices. To reach that volume, Westinghouse is aiming at increasing its overall market position by about 25 pct.

Declaring that many new products and projects would make their appearance in the near future, he listed several with particularly strong potentials:

Practical industrial application of atomic power; low cost air conditioning for homes (including the heat pump); color TV; rapid growth in such appliances as dishwashers and garbage disposal units; and continued increase in capacities of all power apparatus.

W. J. During, Precision Castings Co., Syracuse, N. Y., new president, American Die Casting Institute.

# FOUNDRY: Set Standards To Up Sales

**Steel Founders Society circulates proposed minimum castings standards . . . Hope higher quality products will boost sales . . . Fear castings faults drove customers to other processes—By *T. M. Rohan.***

◆ CONCERTED DRIVE to recapture markets for independent steel foundries through overall quality improvement, lifting lagging steel foundries by their bootstraps if necessary, was launched last week by Steel Founders Society of America.

F. Kermit Donaldson, society executive vice-president, told THE IRON AGE last week the group has begun circulation of a set of recommended minimum standards for commercial carbon steel castings to users and producers of steel castings. These standards are the first in the 100-year history of the industry, sum up collective know-how of the entire industry. (Steel Founders represent 90 pct of independent tonnage shipped in the U. S. and more than half of all tonnage shipped including captive foundries.)

### See Quality Rise

The industry hopes these standards—aimed at best utilizing the physical properties of steel—will eventually become standard specifications for contracts. Acceptance, of course, will be voluntary. But foundrymen believe widespread use will raise overall quality of steel castings in the U. S., bring a commensurate increase in sales. Foundries currently working at low standards for immediate competitive reasons will be able to make quality a competitive factor, bringing up the overall standard of the industry.

Total castings shipped in 1951 including captive foundries was slightly over 2 million tons. In 1952 it was 1.92 million and last year 1.82 million. Of this total over half were shipped by independent members of the society. For the year to date shipments are at the rate of 85 pct of the base figure of 1947-1949. Total last year for members was at 113 pct of the base figures.

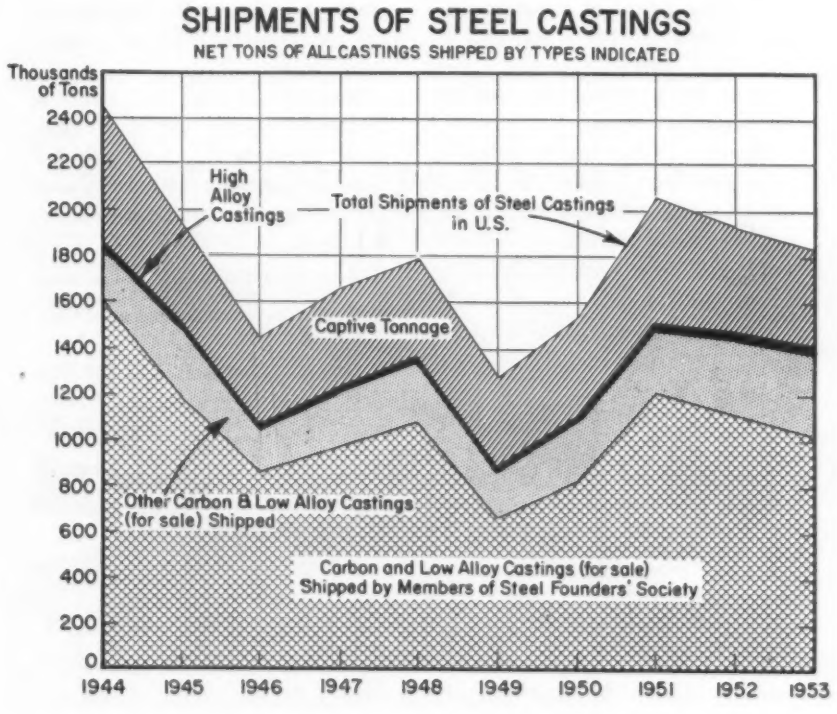
Some portion of the decline, the society believes, has been due to faults in castings which influenced customers to use welding forgings, assembled parts and other alternate forms. Correct application and widespread use of the new proposed standards are expected to bring back a good share of the market.

Standards most widely used at present are those of American Society for Testing Materials (ASTM A-27 52-T), which are based on specifications for resulting physical properties. Proposed new standards do not conflict in any way since they are concerned only with chemical properties and technique of their application. Assumption is that if foundries stay within recommended chemical content latitudes, only physical properties will have to be specified. Thus proposed standards are lower than present ASTM specifications but higher than some presently being shipped.

Factors emphasized in the recommended standards are quality control procedures, heat treatment, furnishing of casting drawings with pattern equipment by the foundry customer, chemical content, variation limits, and visual and gauge inspection requirements. When customers furnish casting drawings with patterns, the foundry assumes responsibility for checking to insure accurate dimensions on finished castings. This is important for wood patterns subject to long storage when contraction and warping is sufficient to create an out-of-shape casting.

### Heat Treat Helps

Heat treating requirements include full annealing, single normalizing or tempering. Studies by the society indicates this greatly improves machining characteristics,



lowering ultimate cost of components.

Among the typical standards proposed are:

1. Maximum riser and gate stub projection of ⅛ in. on risers or gates to 4 in. with maximum ¾ in. on risers 30 in. and over. Removal of gates and risers shall not produce depressions more than ⅛ in. below casting design surface on castings under 20 in. maximum dimension. Casting weight tolerances are plus 5 and minus 3 pct.

2. Heat treating by full annealing, normalizing or normalizing and tempering at manufacturer's option with no more than 75°F difference between hottest and coolest part of casting. Cooling methods are also detailed for the three heat treating methods.

3. Welding is permitted and should include complete removal of the defect, thorough cleaning, and welding by standard society recommended methods.

4. Sampling, inspection and testing procedures are also detailed for various lots.

5. Chemical and mechanical property requirements are:

| Chemical Composition—Maximum Pct | | | |
|---|---|---|---|
| C* | 0.33 | Mo** | 0.20 |
| Mn* | 0.70 | Ni** | 0.50 |
| Si* | 0.80 | Cr** | 0.25 |
| P | 0.06 | Cu** | 0.50 |
| S | 0.06 | | |

*For each reduction of 0.01 pct carbon under the maximum specified and increase of 0.04 pct manganese above the maximum specified will be permitted.

*Minimum silicon permitted is 0.25 pct.

**Total content of these unspecified elements shall not exceed 1.00 pct.

| Mechanical Properties*** | |
|---|---|
| Tensile Strength Minimum Psi | 60,000 |
| Yield Point Minimum Psi | 30,000 |
| Elongation in 2 in. Pct Minimum | 24 |
| Reduction in Area Pct Minimum | 35 |

***Mechanical properties shall be determined on the standard 0.505 in. diam tensile test bar, either with or without threaded ends.

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# BUDGET: Gets Short-Term Defense Cuts

**Defense Dept. slashes current spending by $5 billion . . . But contracts for future delivery, payment jump from $9.2 to $16-$19 billion . . . 1955 deficit will be $4.7 billion—By *N. R. Regeimbal.***

◆ TREASURY SECRETARY Humphrey and Budget Director Roland Hughes revealed last week that Federal spending during this fiscal year of 1955 (commenced last July 1) will be $1.6 billion less than had been estimated last January.

At the same time, however, revenue will be down $3.4 billion dollars resulting in a deficit of $4.7 billion, almost twice the amount anticipated in January.

The Administration, says Mr. Humphrey, is still striving for a balanced budget although it is now $1.7 billion further away than at the end of fiscal 1953.

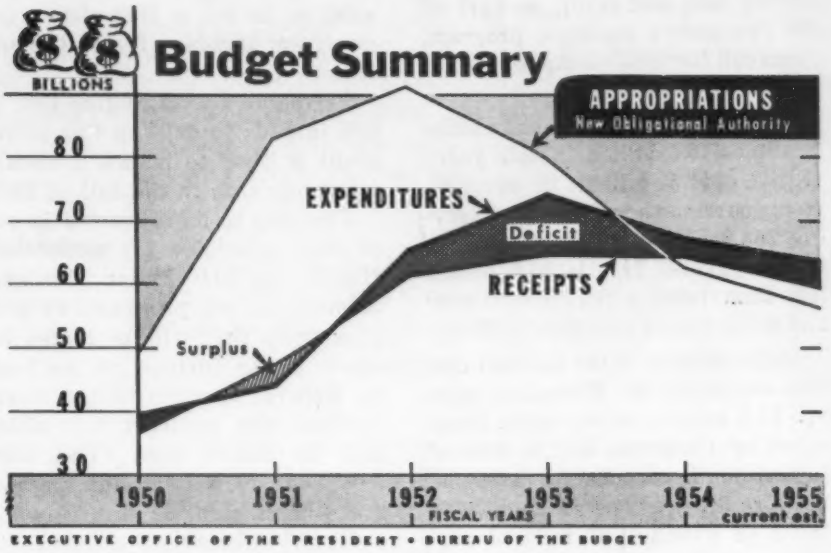
### Cut Defense $5 Billion

Biggest cut in current budget is a $5 billion reduction in military spending—some $3 billion deeper than originally scheduled last January. Mr. Humphrey says outlays for national security this year — some $8 billion less than 1953 estimates—result from "squeezing the water" out of current defense spending through better management and administration.

Largest reductions in military spending stem from major procurement and production; aircraft, ships, vehicles, weapons and ammunition. These expenditures totalled $13.2 billion, $2.5 billion less than last year, $4 billion less than in fiscal 1953.

Another $1 billion was lopped off expenditures for operation and maintenance, which will amount to $8.1 billion. Continued high level of spending is scheduled for modern weapons and electronic warning equipment; for substantial addition to military public works, and to maintain research and development activities within 8 pct of the peak reached in 1953.

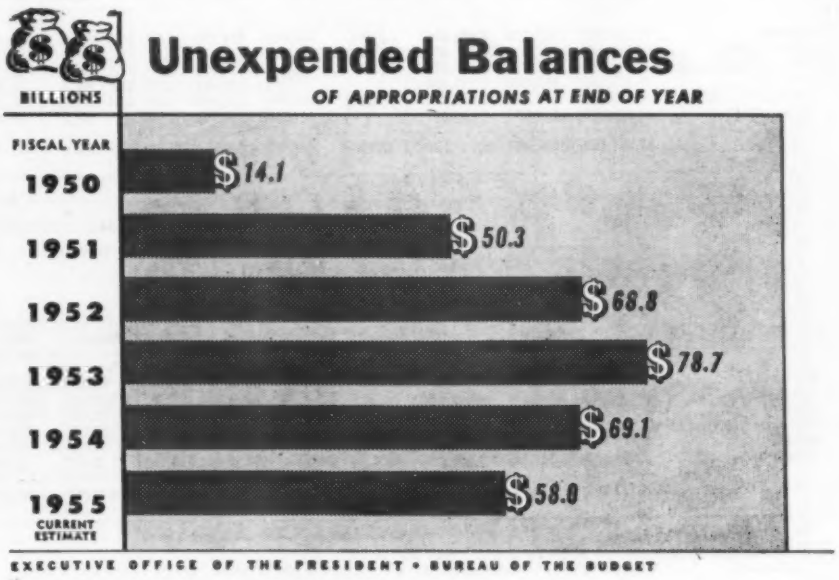
By "living off the shelf" and moving toward balanced stocks, Mr. Humphrey says, the Government will buy 15 pct less subsistence, 50 pct less clothing and 55 pct less spare parts, organizational equipment, and supplies than in 1953.




### Future Spending Zooms

However, new contract obligations of Defense Dept. for hard and soft goods, construction in fiscal 1955 will total between $16 and $19 billion, double the orders placed in the last fiscal year (ended last June 30), which totalled $9.2 billion.

Apparent contradiction between the $5 billion reduction in current budget and the $9 billion increase in contracts let is explained by the time lag of one year to 18 months between letting of contracts and



actual cash payment for delivery of goods.

Future defense budgets of 1956 and 1957 will show heavy defense spending — reflecting the present stepped-up rate of contractual obligations during fiscal 1955.

### See Less Revenue

Some $250 million will be spent on price supports for metals (including lead and zinc), as part of the President's stockpile program. Plans call for total stockpile expenditure of $900 million.

Government will send out checks totaling $75.5 billion in this year; receive $11.5 billion in receipts from sources other than taxes, leaving $63.9 billion to be supplied by the taxpayers. This is $4.5 billion less than taxes supplied last year and $10.3 billion less than in 1953.

Major factors in the reduced revenue estimates, Mr. Humphrey says, are $1.1 billion cut in excise taxes voted by Congress, and a drop of $1.5 billion in corporation taxes and $300 million in personal income taxes as a result of reduced corporate profits stemming from the recent recession.

DEFENSE

## Engines:

### Plan free-piston powerplant for Liberty ship.

Maritime Administration, planning experiments with a variety of new propulsion plants to improve efficiency of merchant vessels, is to get a free-piston gas generator-turbine from General Motors Corp.

Cleveland Diesel Engine Div. of GM intends to develop this power plant in time to install it aboard a Liberty ship in the fall of 1955.

The ship to be converted is one of four scheduled for modernization in an $11 million Maritime Administration program. Propulsion units that will be tested include a gas turbine, to be built by General Electric Co.; a steam turbine, the contract for which will be placed soon (THE IRON AGE, Sept. 16, p. 120); and the new free-piston plant.

Major advantages claimed for the free-piston plant are: (1) It combines high thermal efficiency of the two-stroke diesel cycle with flexible power takeoff characteristics of the turbine. (2) It allows a multiplicity of applications. (3) It eliminates many of the moving parts of the conventional diesel.

## IRON & STEEL: August Output By Districts

As Reported to the American Iron and Steel Institute

| BLAST FURNACE —NET TONS DISTRICTS | Annual Capacity | PIG IRON August | PIG IRON Year to Date | FERROMANG., & SPIEGEL August | FERROMANG., & SPIEGEL Year to Date | TOTAL August | TOTAL Year to Date | Pct of Capacity August | Pct of Capacity Year to Date |
|---|---|---|---|---|---|---|---|---|---|
| Eastern | 17,261,850 | 899,378 | 7,951,061 | 7,914 | 141,982 | 907,292 | 8,093,043 | 61.9 | 70.4 |
| Pitts.-Yngstn. | 29,501,270 | 1,556,272 | 13,015,481 | 21,767 | 163,217 | 1,578,039 | 13,178,698 | 63.0 | 67.1 |
| Cleve.-Detroit | 8,714,680 | 440,410 | 3,786,272 | | | 440,410 | 3,786,272 | 59.5 | 65.2 |
| Chicago | 16,371,250 | 964,661 | 8,273,496 | | | 964,661 | 8,273,496 | 69.4 | 75.9 |
| Southern | 6,273,080 | 414,175 | 3,200,320 | 8,063 | 61,111 | 422,238 | 3,261,431 | 79.2 | 78.1 |
| Western | 3,879,260 | 254,395 | 1,791,961 | | | 254,395 | 1,791,961 | 77.2 | 69.4 |
| TOTAL | 82,001,390 | 4,529,291 | 38,018,591 | 37,744 | 366,310 | 4,567,035 | 38,384,901 | 65.6 | 70.3 |

| STEEL —NET TONS DISTRICTS | Annual Capacity | TOTAL STEEL August | TOTAL STEEL Year to Date | Pct of Capacity August | Pct of Capacity Year to Date | Index** August | Index** Year to Date | ALLOY STEEL* August | ALLOY STEEL* Year to Date |
|---|---|---|---|---|---|---|---|---|---|
| Eastern | 25,864,060 | 1,369,894 | 11,521,601 | 62.3 | 66.9 | 96.8 | 106.0 | 78,102 | x624,175 |
| Pitts.-Yngstn. | 44,348,060 | 2,269,216 | 19,859,912 | 60.2 | 67.3 | 80.0 | 89.4 | 339,820 | 2,620,117 |
| Cleve.-Detroit | 12,791,780 | 604,370 | 5,472,906 | 55.6 | 64.3 | 98.8 | 114.2 | 35,147 | 391,556 |
| Chicago | 27,371,700 | 1,553,933 | 13,605,195 | 66.8 | 74.6 | 99.9 | 111.5 | 84,672 | 745,335 |
| Southern | 6,932,340 | 421,832 | 3,467,430 | 71.6 | 75.1 | 121.0 | 126.9 | 4,131 | 52,050 |
| Western | 7,022,470 | 447,862 | 3,499,092 | 75.1 | 74.8 | 119.0 | 118.6 | 7,217 | 53,677 |
| TOTAL | 124,330,410 | 6,666,907 | 57,426,136 | 63.1 | 69.4 | 93.7 | 103.0 | 549,089 | x4,486,910 |

* Included under Total Steel.
** Based on average production of the three years 1947-1949 as 100.
x Revised.

## Improve Helicopters

Marine Corps aviators like the capabilities of a rocket power system developed by Reaction Motors, Inc., of Rockaway, N. J., for improving the performance of standard helicopters.

This "ROR" (rocket on rotor) system consists of three small rocket engines mounted on the tips of the rotor blades, a propellant tank placed above the rotor hub, propellant lines, and a few valves and controls.

Dry weight of the ROR apparatus, which converts hydrogen peroxide fuel into high-temperature steam, is about 67 lb.

Use of ROR adds approximately 20 pct to the power of a helicopter and permits it to take off with greater loads. The system, say the Marines, also provides an improved rate of climb, a more satisfactory hovering ceiling, and better control during glides.

## Study Defense Traffic

New study of freight traffic management within the Defense Dept. is being made for the Hoover Commission under acting direction of John R. Staley, traffic vice president of the Quaker Oats Co. A concurrent survey of Defense Dept. passenger traffic management is under direction of James K. Knudson, former Interstate Commerce Commissioner.

## Contracts Reported

Including description, quantity, dollar values, contractor and address.

Wire WD-1/TT in. 40800 miles, $2,700,552, Plastic Wire and Cable, Jewett City, Conn.

Wire WD-1/TT in. 9600 miles, $710,400, Phelps Dodge Copper Products Corp., New York.

Wire WD-1/TT in, 19200 miles, $1,228,224, General Insulated Wire Co., Providence, R. I.

Trailer, fire control van 2 ton, 4 wheel, 38, $701,066, Fruehauf Trailer Co., Detroit, Mich.

M44 series trucks 2½, 132 ea, $799,857, Reo Motors, Inc., Lansing, Mich.

Drift height indicators and spare parts, 325, $100,977, Texas Instruments, Inc., Dallas, Tex.

Compressed gas tank semi-trailers, 27, $246,600, Independent Engineering Co., Inc., O'Fallon, Ill.

# Report To Management

as a nation to face international facts of life caused the fumbles with out-of-date colonialism in Southeast Asia and Africa, led to the unhappy failure of the European Defense Community.

**The spectre of 12 German divisions** called for by EDC sparked a Gallic nightmare far more terrifying to Frenchmen than the cold statistics; 240 Soviet divisions under arms.

rejection as the Administration shifts to make up for the stillborn European Army, to counter Red China's success in Southeast Asia. Since the West isn't going to be able to link hands as firmly against the ever-present danger, U. S. will walk softly (but not alone), must carry a good deal bigger stick.

**President Eisenhower's call for** Universal Military Training plan was the tip-off. You can expect a bigger defense effort than anytime since the cold war boiled over the 38th parallel. (See Editorial, page 7.) Economic pendulum will swing back from last winter's mild recession a lot faster than it has thus far.

of $2.1 billion cut in Defense Dept. spending for the current fiscal year. Pentagon plans to almost double last year's net total of defense contracts. Actual increase in outgoing expenditures won't occur for a year to 18 months after contracts are let.

**Present dollarwise cuts in defense** spending reflect payment on reduced orders made during Korean stalemate days of early 1953. This time lag between Defense Dept.'s taking on of obligations and payoff in cash enables Republicans to demonstrate economy and defense beef-up at the same time—and when that time is the fall of an election year it makes excellent political sense.

with the nation's safety however. Ike has decided to give out with the un-sugar-coated facts before election day, trust that voters will appreciate the Administration's awareness of new, tougher look of the cold war.

**It's a line of reasoning** hard for the Democrats to pick apart—it will be tough to nail the Administration for sleeping at the switch while Ike stumps for UMT.

is economist and mobilization expert Eliot Janeway's term for the upcoming return to a cannons-plus-Cadillacs economy which will look somewhat like 1951's minus a good deal of inflationary pressure.

**Traditional business bellwethers** are being replaced. As Mr. Janeway puts it, "The economy is no longer subject to the business cycle. Rather it is the defense cycle to which business is now subject."

and now with the marriage of TV and telephone recently performed by a San Diego electronics firm. Possibilities that leap to your mind may be reality sooner than you think.

**If you're a sales manager,** can't you visualize your crack salesman dialing his voice, face and the product in full color to the desks of a dozen purchasing agents in a single morning, then moving out of the office only to sign up solid prospects?

**All this may be swell you say** but what good will TV-phone do if the people you want to reach aren't similarly equipped? It's going to be like the chicken-or-egg question that prompted doubts on the feasibility of commercial TV only 8 short years ago when the wiseacres prophesied that sponsors wouldn't back good programs until more sets were sold, and people wouldn't buy sets to watch poor TV.

# INDUSTRIAL BRIEFS

**Shopping Center** . . . U. S. Pipe and Foundry Co., Birmingham, will build a shopping center near its North Birmingham plant for the benefit of its employees and other residents of the area.

**Dividend Declared** . . . Giddings & Lewis Machine Tool Co. declared 40 cents a share on the common stock, payable Sept. 30 to stockholders of record at the close of business Sept. 23.

**Annual Course** . . . Purchasing Agents Assn. of Rochester, Inc. is sponsoring the 15th Annual Purchasing Course which begins Sept. 23, at the University of Rochester-University School.

**Outing** . . . Meldon Steel Co., Brooklyn, will hold its first annual golf and fishing Outing for Central New York purchasing agents and friends on Wednesday, Oct. 6, at the Syracuse Yacht and Country Club.

**Breaks Ground** . . . Robertshaw-Fulton Controls Co. broke ground in Milford, Conn., for a new $2 million plant of the Bridgeport Thermostat Div.

**New York Office** . . . Lithium Corp. of America, Inc. opened a sales office in New York City at 540 Lincoln Bldg., 60 E. 42nd St., New York. J. Douglas Campbell is the representative in charge.

**Good Will Tour** . . . Earlier this week a group of Pittsburgh business and industrial leaders, headed by Col. W. F. Rockwell, chairman of Rockwell Mfg. Co. and Rockwell Spring and Axle Co., left on a three-week "good will" tour of seven European nations.

**Purchased** . . . The Garrett Corp. has purchased the McConkey-Docker and Co., Phoenix industrial supply house, which will become a branch company.

**Canadian Subsidiary** . . Colson Canada Ltd., a wholly-owned subsidiary, has been formed by The Colson Corp, Elyria, Ohio. Roy D. Hill was appointed vice-president and general manager of the Toronto subsidiary.

**Appointed** . . . American Machine Tool Distributors' Assn. appointed James C. Kelley, general manager of the association.

**Fall Courses** . . . Pratt & Whitney Aircraft will start apprentice training courses for jet engine metalsmiths and for machinists this fall. The courses, which begin Oct. 4, are for three years.

**New Plant** . . . The Foxboro Co., opened a new 15,000 sq ft plant in Pittsburgh last month at 2270 Noblestown Rd.

**Good Idea** . . . Bernard E. Murphy, a production co-ordinator in the transportation and Generator Div. of Westinghouse Electric Corp. in East Pittsburgh, was awarded $4,008 by the company for an idea that saves time and money in building electric generators.

**Operating** . . . Clariton Works of U. S. Steel Corp. put three new reconstructed coke oven batteries into operation. The new No. 7 battery was scheduled to push coke last week. New batteries numbers 8 and 9 were to follow within the week.

"Copeland went duck hunting out of season again, I see."

**Makes Profit** . . . Mercast Corp. reports a new profit of $23,592.15 for the first six months of 1954.

**Approved Increase** . . . Barium Steel Corp. reports that a substantial majority of the shareholders approved the increase in authorized capital stock from 2,500,000 shares to 5,000,000 shares.

**Distributor Named** . . . The Parker Appliance Co., Cleveland, named Rockford Tool & Transmission Co., Rockford, Ill., as authorized distributor for hydraulic Hoze-lok fittings and hose assemblies.

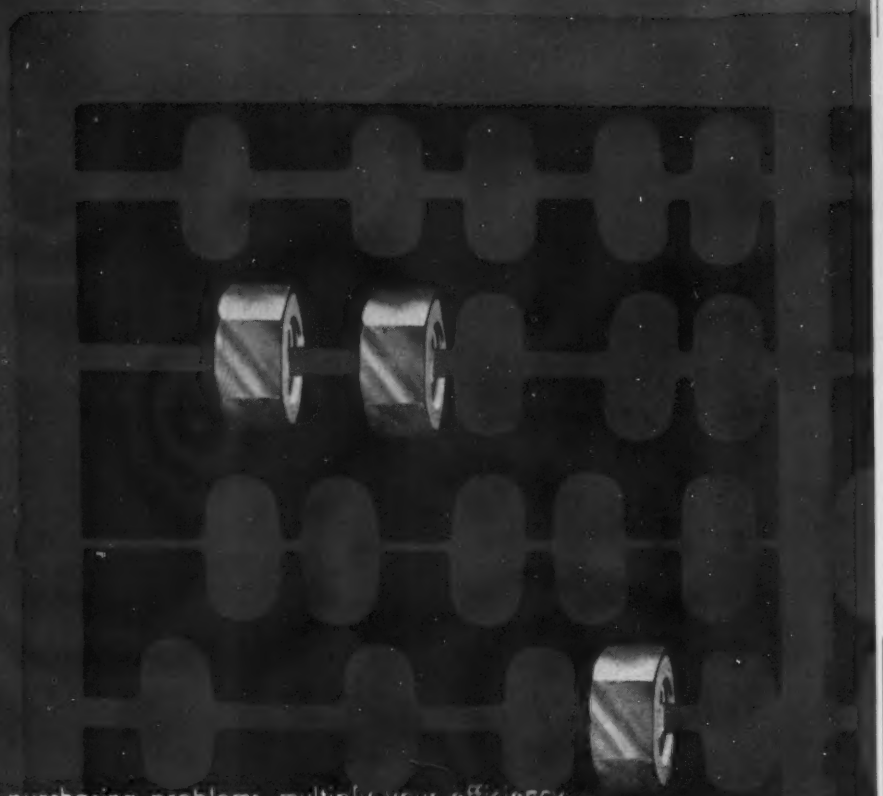
**Acquired** . . . Continental Foundry & Machine Co. has acquired The Bar and Tube Div. of The Medart Co., St. Louis, Mo.

**Bon Voyage** . . . Eugene R. Oeschger, general manager, Foundry Dept., General Electric Co., Schenectady, and Alfred E. Blake, Jr., manager - Engineering, left earlier this month on a tour of 16 European foundries in nine countries. The trip is designed to investigate the latest technological advances in these foundries and to exchange ideas and know-how on foundry methods and facilities.

**Machine Tool Firm** . . . Joseph M. Kalins, Inc., 113 East Washington Ave., Bridgeport, is a newly formed machine tool distributing firm. The firm will specialize in the handling of machine tools, new and used, and is fully equipped to service tools and fulfill engineering requirements for tool room and production equipment.

**Transfer** . . . General Motors has transferred its Electro-Motive Div. plant in Cleveland to the Euclid Div. for manufacture of a new product in the earth-moving field.

For products you can *count* on



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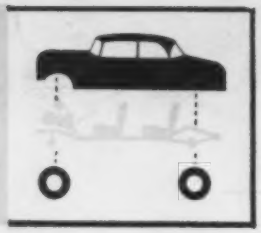


# GM, New Challenger In Earthmoving

**Euclid Div. thriving after year under GM management . . . Has 75 pct of off-highway dumping equipment sales . . . Now shooting for leadership in the $1 billion-a-year earthmoving market—By *R. D. Raddant.***

◆ WHAT HAPPENS when an organization with the size, facilities and resources of General Motors takes over a small but highly successful company and establishes it as one of its far-flung divisions?

The answer can be found in the 1-year history of GM's new Euclid Div. This well-established and successful maker of earthmoving equipment already had 75 pct of the market for off-highway bottom and rear dumping equipment. It was also penetrating about 15 pct of the market for scrapers, a field it had just entered, when the Cleveland company was acquired by GM last September.

**Show New Crawler** . . . Last week in sort of a progress report and new model introduction at the GM proving ground, Euclid unveiled a new twin-engine crawler tractor as an announcement of its entry into that field and introduced three new rubber-tired scrapers to round out this line.

R. Q. Armington, the division's general manager, said that at the time GM took over Euclid, there was "not even a line on paper" for the new scrapers and that an engineering group had not yet been set up for the crawler.

"We're still a little outfit," he said significantly, "but with big backing."

The importance of Euclid to GM, and vice versa, is illustrated by the size of the earthmoving field, described by Euclid officials as a $1 billion annual market. More than 50 pct comes under the crawler tractor and allied equipment.

**Boost Sales Goal** . . . Among the things that have happened to Euclid in its 12 months as a GM division was the setting up of a goal of 2½ times present sales volume by 1958, a mark that is expected to be reached by the new crawler line and increased penetration of the scraper market. Some units sell for as high as $44,000. Euclid's current sales have run roughly $50 million a year.

FIRST MODELS to come from Euclid Div. since it's been under GM's wing, an overhung engine scraper, left, twin-engine 380 hp crawler tractor at right.

The new division's output in the first year fluctuated little and employment remained at about 1700 level. But the engineering staff was multiplied three times, the new products were developed, and its birthday was celebrated by a "gift" from the parent corporation of a new plant in Cleveland formerly occupied by GM's Electromotive Div.

**Remain In Construction** . . . The plant will be used to manufacture the new line of crawler tractors. The 53,000-lb tractor developing 380 hp is the first and largest of a complete line Euclid intends to build. Crawler tractors and attachments have a yearly sales volume of $400 million. However, Euclid will not go into the agricultural field, but will concentrate on the construction industry side.

Some of the reasons for GM's entry into this field are apparent after study of its program. Obviously, it places GM in the road building program which will be big business for years to come. Secondly, it is a tailor-made market for other GM products.

For example, before GM took over, about 50 pct of Euclid equipment was powered by engines produced by GM's Detroit Diesel Div. Now it will be 100 pct. The new crawlers will all be powered by GM diesels with Allison Div. torque converters and Allison Torqmatic transmissions.

**Use GM Parts** . . . Up to now, Euclid has done comparatively little of its own manufacturing. It has no foundry or forge shop. Volume is small enough that buy-

### Automotive Production

*(U. S. and Canada Combined)*

| WEEK ENDING | CARS | TRUCKS |
|---|---|---|
| Sept. 18, 1954... | 59,025* | 14,075* |
| Sept. 11, 1954... | 71,423 | 13,320 |
| Sept. 19, 1953... | 122,537 | 24,375 |
| Sept. 12, 1953... | 103,387 | 19,476 |

*Estimated. Source: *Ward's Reports*

ing from vendors has been most practical. While there is no indication that this will change, no doubt a lot of the manufacturing will find its way to other GM divisions. Certainly GM parts and facilities will be utilized where practical.

Euclid management has remained much the same, with only a few GM people inserted into the organization at strategic places to aid in turning over to the GM system. It appears to be a happy arrangement all the way around.

## Packard Moves Plant

Last week Packard started one of the biggest industrial moves in its history, transfer of final assembly operations from the main plant area to the new assembly plant leased from Chrysler.

The move, which will take about 45 days, involves transplanting three miles of conveyor lines, 5000 tools, hoists and other equipment. New assembly will start in November when 1955 Packards start to roll. Ray P. Powers, Packard operations vice-president, said that final assembly lines will be keyed to improved production methods. Many outmoded tools will be replaced by new equipment.

### One Floor Operation

At the new plant, assembly operations will be completed on one floor. In contrast, at the old Packard plant the car traveled through four different floor levels in stages of assembly, a high cost operation.

The transfer will bring final assembly and body-making operations under one roof. Briggs formerly made Packard bodies at the same plant, but the building was leased by Packard when Briggs was absorbed by Chrysler.

# Jeeps:

**Could be replaced by Ford's new ¼-ton utility truck.**

AUTOMOTIVE NEWS

It isn't going too far out on a limb to predict that the historic Jeep, which captured the public fancy and served so well in World War II and later years, may be retired to pasture. (THE IRON AGE, Sept. 16, 1954, p. 135.)

A 2-year program financed by the Army Ordnance has resulted in a Ford XM-151, ¼-ton utility vehicle that appears to have surpassed the Jeep in performance and on paper. Only six units have been produced and no contracts have been awarded. Still of experimental nature, its design will be refined as a result of Ordnance tests.

### Longer, Lower, Faster

The XM-151, although outwardly similar to the present vehicle, is somewhat lower, has a longer wheelbase but shorter over-all length, and develops 71 bhp with its 4-cylinder overhead-valve engine compared with 69.5 bhp in the Jeep.

General specifications, as determined by Ford tests, indicate that range is 30 pct greater, acceleration from zero to 20 mph is 38 pct better, and to 40 mph 33 pct better. Weight of the XM-151 is 2140 lb compared to 2720 for the Jeep.

### What's In A Name?

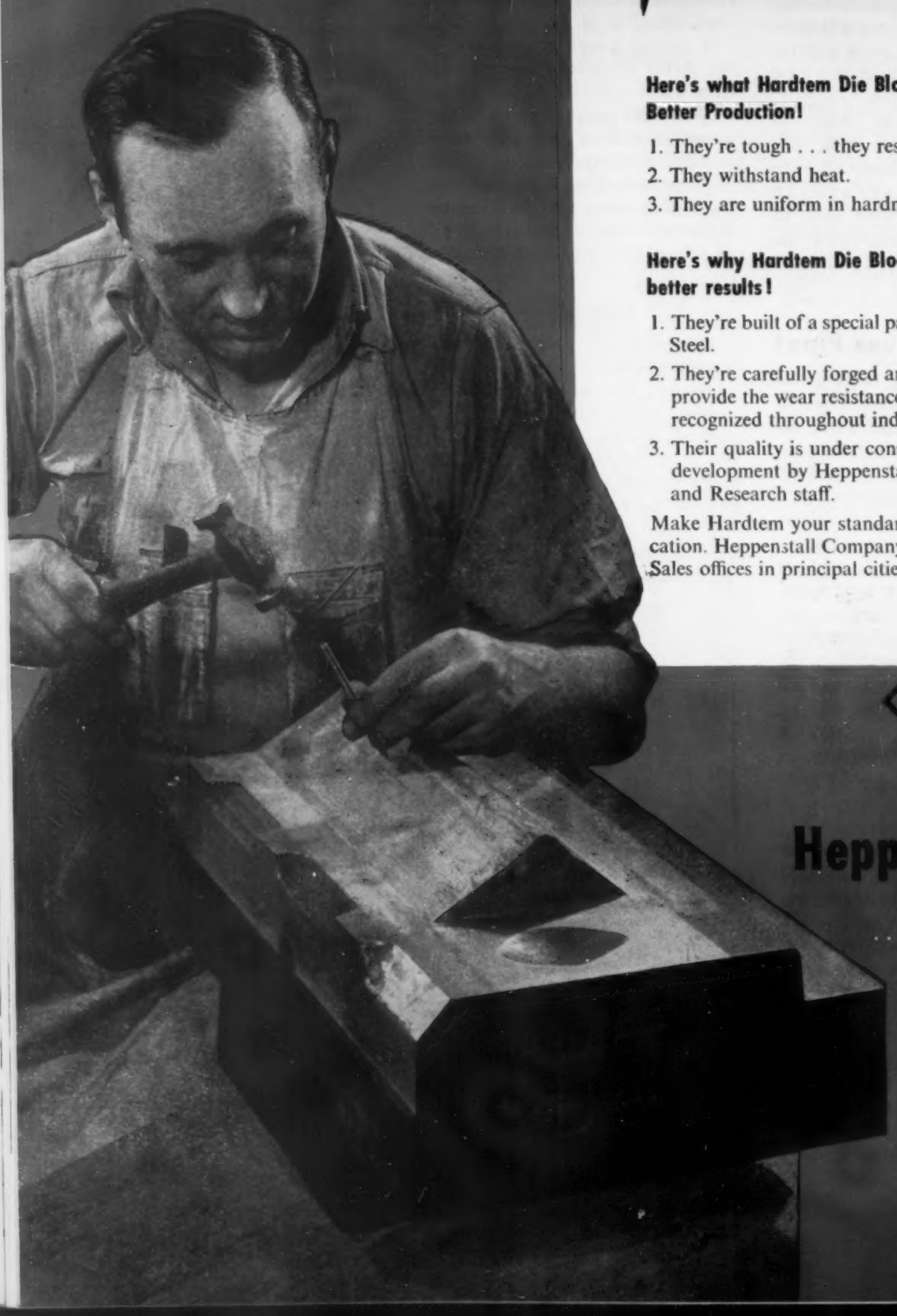
What the new vehicle will be called is a question mark. Willys has already notified automotive writers that Jeep is a Willys copyright, although a good case could be made for "jeep" as a universal word now in the public domain. In any case, if the vehicle ever becomes the standard for the Armed Forces, GI's will have a name for it, and that's the one that will stick. It might be pointed out that this particular contract is the first development project undertaken by Ford for Ordnance since its reorganization program. Ford engineering has concentrated on passenger cars.

**THE BULL OF THE WOODS** — **By J. R. Williams**

OWOOH! DON'T RUN ME THRU THEM CHIPS IN ME SOCK FEET, YOU ROWDIES!
LOOK! HE SOLES HIS SHOES WITH OLD OILY LEATHER BELTIN', THEN STINKS UP OUR HULL NEIGHBORHOOD GRINDIN' 'EM DOWN ON TH' EMERY WHEEL! LOOK AT TH' SURPLUS ON THEM THINGS!
9-24 J.R.WILLIAMS
BORN THIRTY YEARS TOO SOON
T. M. Reg. U. S. Pat. Off. Copr. 1954 by NEA Service, Inc.

# Built For Better Production

## Hardtem Die Blocks



**Here's what Hardtem Die Blocks mean to Better Production!**

1. They're tough . . . they resist impact stress.
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3. They are uniform in hardness.

**Here's why Hardtem Die Blocks assure better results!**

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# Expect New Push for Guaranteed Wage

**Government officials expect another showdown between industry and labor in 1955 . . . Expect unions to press for decision in steel and auto industries . . . Will ask for bids on St. Lawrence—By G. H. Baker.**

◆ LABOR has not given up its fight for the guaranteed annual wage—especially in the steel and auto industries. The "fishing expeditions," the "sounding out" periods are drawing to a close. What lies ahead for labor-management contract talks is the grim phase just prior to adoption or rejection of the guaranteed-wage schemes—the dead-earnest, point-by-point bargaining over the wage plans.

**Expect Big Push** . . . Negotiations over guaranteed wages probably may take priority over all other points at issue in future contract talks, it is believed in government circles. It is pointed out that union officials have been clamoring for adoption of the wage plans for many years. Next year may well be the year when they go all-out to bargain contracts in basic industries like steel and automobiles. Later, they'll go after chemicals, petroleum, the textile industries.

Government labor advisers are readying their charts and their wage-hour data in preparation for the coming battle over guaranteed wages. The subject is almost certain to get an airing on Capitol Hill, and the Administration will be asked to submit data showing what effects guaranteed-wage plans would have in various industries.

Would annual wage plans wipe out the incentive for workers to stick to their jobs, or to seek new jobs?

Would workers tend to draw state unemployment benefits for longer periods than they do today?

Would the added cost to manufacturers mean fewer jobs and higher prices?

**Look for Showdown** . . . Federal labor experts hint broadly that the larger steel firms as well as the leading automobile companies are close to the decisive stage of negotiation with the USW and UAW. The companies will deny this, because they fear premature discussion could force their hands unfavorably. But the subject is far from dead and you can expect it to come to a head again in 1955.

**Call for Bids** . . . First call for bids on construction of the St. Lawrence seaway are to go out about Nov. 1. The upcoming invitation to interested construction firms will deal with the nine-mile canal to be built on the U. S. side of the St. Lawrence. Martin W. Ottershagen, deputy administrator of the St. Lawrence Seaway Development Corp., estimates total construction cost of the canal at about $72 million.

**Ease Realty Sales** . . . Sales of federal real estate are to move with greater ease, now that Ike has approved legislation clearing the way for the government to employ realty brokers in the sale of federal property no longer needed. The new law also authorizes the payment of fees to appraisers and auctioneers.

Realtors point out that under the old method of disposing of property via the sealed-bid procedure, properties often were sold for less than market value. Under the new set-up, the government may have its disposable properties appraised, and the property then will be sold for the market value.

The government has been engaged for some months in a complete survey of all government land-holdings—the first time this huge task has ever been attempted. Following completion of this survey, it is expected that much surplus real estate will be put up for sale — thus getting it back on the tax rolls.

**Spikes Rumors** . . . Rumors that the Federal Government will raise the price of gold are being brushed aside as untrue. Last week in

## Fear Dem. Control

**The new (84th) Congress that convenes in Washington next January may well be a Democrat-controlled Congress. This prospect, should it materialize into reality, would spell virtual nullification of President Eisenhower's legislative hopes and plans for the next 2 years.**

**The likelihood of a Democrat-controlled House is stronger at this time than the possibility of Democratic control in the Senate, but the loss of either or both chambers to the opposite party historically has spelled political frustration for both sides.**

**Republican national committeemen won't admit it publicly, but they are gravely concerned over the lukewarm showing made in Maine last week by the Republican congressional slate.**

# What do you want in the welded stainless tubing you use?

Perhaps your biggest headache is corrosion. Maybe it's oxidation, or contamination, workability, or some combination of these. Whatever it is, the solution lies in getting the *right* welded stainless tubing for your particular operation.

With B&W welded stainless tubing you can be sure you are getting not only the right grade of stainless steel but also tubing with the properties you desire for easy fabrication and long service life.

Put your stainless tubing problems up to Mr. Tubes, your link to B&W, who represents the B&W Headquarters Technical Staff, Regional Sales Offices, and a cross-country network of experienced tubing distributors. You can have confidence in his suggestions, based on broad and intimate experience with stainless applications, to help you make the right choice for your requirements.

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***TUBULAR PRODUCTS DIVISION***
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B&W SEAMLESS and WELDED TUBES

TA-4033 (SWP)

Washington a Treasury Dept. spokesman said the rumors, which have originated in gold-mining countries such as South Africa, are without basis and the Government has no intention of paying more than $35 an ounce for its gold.

Meanwhile, it was disclosed that the Government sold $67 million more gold than it bought in the first 5 months of this year. Treasury Department said its gold reserve on June 1 amounted to only $21.9 billion.

Biggest net buyer of U. S. gold was West Germany, which took $40 million worth. Other buyers included Portugal, Lebanon, Uruguay and the Bank for International Settlements at Geneva, Switzerland. Sales to foreign governments and their central banks in the period were generally smaller than in any period since the autumn of 1952.

The U. S. bought $13.2 million from Bolivia and $5.5 million from Vatican City in the first five months of this year.

## Buying Team Here

Now visiting the U. S. is a purchasing mission from the Burmese Government, responsible for buying capital goods, equipment, supplies, and services.

Headed by U Tin, minister of finance and revenue, the mission will be in this country through Oct. 15. Besides handling the purchasing job, the Burmese officials will discuss partnership arrangements with firms interested in joint enterprises in Burma and study the operation of various American industries.

An advance party of the group will visit Washington on Sept. 22-25 and move on to New York, where it will remain until Oct. 5. This party will distribute bid invitations and detailed specifications for goods and services.

Businessmen may arrange appointments with the Burmese mission through the U. S. Commerce Dept.'s nearest field office.

The Embassy of Burma, at 2300 S St., N. W., in Washington, will make available contract forms and a 38-page catalog of equipment to be bought by the mission.



# TRADE: Hear GATT Pros, Cons

**State Dept. weighs General Agreement on Tariffs and Trade . . . Urge plan be sent to Congress . . . Celler asks complete tariff overhaul—By *N. R. Regeimbal.***

◆ MULTI-NATION General Agreement on Tariffs and Trade (GATT) should become the international organization to which businessmen can take their tariff problems and it should be armed with power to enforce trade contracts and prevent discrimination, State Dept. officials are being told.

At the same time, the Department, which has broad tariff-fixing powers under the present set-up, is hearing its leadership challenged during public hearings in Washington in advance of a general meeting at Geneva in November. Both proponents and opponents of the GATT plan are urging the plan be submitter to Congress.

### Wants Complete Overhaul

State Dept. is seeking comment on the GATT plan before the Geneva conference at which it hopes to develop a permanent trade-tariff organization. Leading off the hearings were a group of opponents, including several tariff organizations. Several speakers urged this country withdraw from GATT on the grounds that it usurps the right of Congress to set foreign trade policy and because the organization is

"totalitarianism with the additional overtone of a highly cynical contempt for the electorate."

Rep. Emanuel Celler (D., N. Y.) suggested a complete reexamination of this country's tariff schedule; the immediate removal of tariffs on strategic minerals and metals, and called on the Administration to submit a detailed trade program to Congress.

Other speakers criticized the secrecy of GATT deliberations and urged that State Dept. be prevented from participating in any world trade conferences without congressional mandates.

Spokesmen for business, farm and labor groups urged expansion of the GATT organization at a later hearing, although they too urged congressional sanction of treaties which it might develop.

### Weigh Other Problems

John J. McCloy, chairman of the board of the Chase National Bank and former high commissioner for Germany, praised the agreement as a valuable weapon in the cold war. Other industry spokesmen said the group should be given powers to see that trade contracts are upheld; prevent abandoning of the reciprocity principle; and regulate the extent of retaliation which aggrieved nations be permitted to take.

While no board revisions of specific tariffs will be under discussion at the Geneva conference, the 33 nations participating will attempt to strengthen the agreement and set up a permanent organization. They will also consider special treatment for underdeveloped countries; problems arising out of agriculture quotas and export subsidies; provisions relating to the impositions of import restrictions for balance of payments reasons, and provisions relating to tariff concessions.

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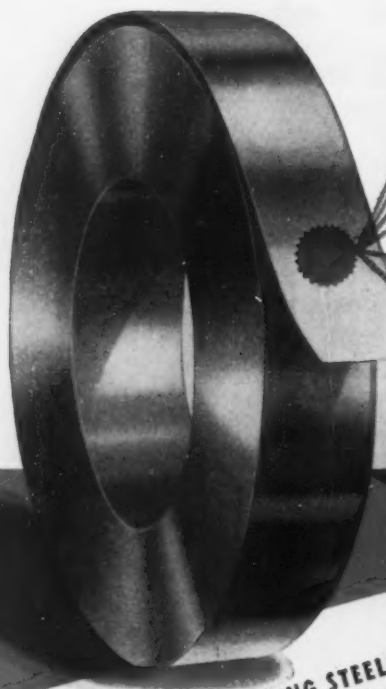

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WEST COAST REPORT

# Steel Producers Seek New Fabricators

**Coast mills campaign to demonstrate market potential . . . Offer research, marketing facilities . . . Steel capacity is available locally yet 2.5 million tons of finished goods come in yearly—By R. R. Kay.**

◆ SHARP-EYED, sales-minded steel producers on the West Coast are beating the bushes with active, nationwide programs to get steel users to open plants here.

Through chambers of commerce, railroads, utilities, and banks they're campaigning to show that materials and markets are here, ready for the manufacturer. One producer is offering, all for free, the use of its own "special services": commercial research, market development, metallurgical advice, credit counsel, traffic and transportation help. Even advertising counsel.

**Import 2.5 Million Tons** . . . They have convincing evidence. Probably the most significant fact for the metalworking industry is that 2.5 million tons of products using steel in their manufacture are still shipped into the western states each year from the East and Midwest. They are: 1.5 million tons of motor vehicles and parts; 200,000 tons of machinery and parts; 100,000 tons of agricultural equipment and parts; 250,000 tons of household appliances; 200,000 tons of electrical equipment; 250,000 tons of various other fabricated steel products.

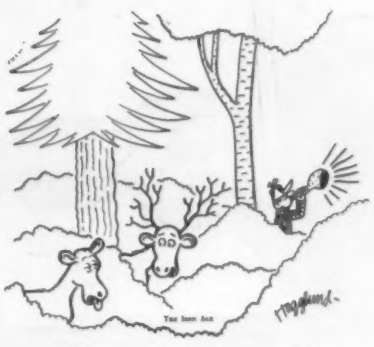
Steel production is now a major industry here. More and more the West is depending on its own output, and has already reached a high degree of self-sufficiency. Producers say with adequate steel available, plus freight differentials and other savings, more of those products could be manufactured in the West, and at a satisfactory profit.

A persuasive market development brochure by Columbia-Geneva Steel Div., U. S. Steel Corp., cites a good example about motor vehicle parts for assembly plants and replacements. The West annually imports one million tons of parts and, at present, fabricates only 30-40,000 tons. (See THE IRON AGE, Aug. 12, 1954, p. 95.)

**Propose Pipe Plant** . . . Multimillion dollar steel pipe plant looks like a good bet for Utah.

Alden G. Roach, president of Columbia-Geneva and Consolidated Western Steel divisions of U. S. Steel Corp., said it would be built at the Geneva works. The proposed new plant would replace Consolidated Western's California pipe production facilities at South San Francisco, Berkeley, and Los Angeles (Maywood). The pipe is for transmitting natural gas and petroleum products.

Mr. Roach said his company is also thinking about setting up an anhydrous ammonia plant at the Geneva works, with expansion of coal synthesis plants and building of more ovens.



"Listen dear, our song!"

**Boost Foil Output** . . . Kaiser Aluminum & Chemical Corp., Oakland, Calif., jacked up its aluminum foil production capacity 50 pct, to 1.5 million lb per month. Already making 10 pct of the nation's supply, Kaiser put into operation a new 60 in. four-high foil mill at its Permanente, Calif., plant. The new mill can process 3000 fpm in widths equal to the widest made in the country, the company says. Kaiser now sells about a half million pounds a month, approximately 40 pct of it in the West.

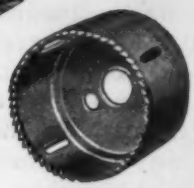
And they're talking still more expansion. A new mill goes up at Ravenswood, Va., next year (see THE IRON AGE, Sept. 2, 1954, p. 152) and is scheduled to turn out its first foil July 1956. Kaiser could accommodate two more mills at the Permanente site; and there are reports here that they are eyeing a going Midwest mill.

**Build New Facilities** . . . Gates Rubber Co. will spend $1 million for a new 216,000 sq ft warehouse and manufacturing building next to its raw materials warehouse in Denver. Completion date April 1955 . . . Nut Corp. of America established in Los Angeles (Compton) to produce machine screw nuts by a powder-metallurgy process . . . Fluor Corp., Ltd., Los Angeles, purchased 55 pct interest in Singmaster & Breyer, Inc., New York, process engineers for the metallurgical and chemical industries . . . Gardner Electric Mfg. Co., San Francisco, transformer manufacturers, bought by Federal Pacific Electric Co., Newark, N. J., producers of electrical controls.

# *Cut...*

# LARGE HOLES

## ...thru any machinable materials up to 1⅛ *INCHES* thick:



**Here is a premium tool which makes it possible to saw holes in one short operation ... large holes which heretofore had to be laboriously machined "a-chip-at-a-time."**

MARVEL High-Speed-Edge Hole Saws have strength to withstand the terrific peripheral strains of heavy duty operation in lathes, drill presses or portable power tools. They have a high speed steel cutting edge which is electrically welded to a tough, alloy steel body, high speed steel pilot drills, heavy hexagonal shanked arbors and sufficient set for deep drilling. They are self-aligning, as the larger diameter saws float on their arbors and are driven by double drive pins. They will saw round holes accurately in any machinable material.

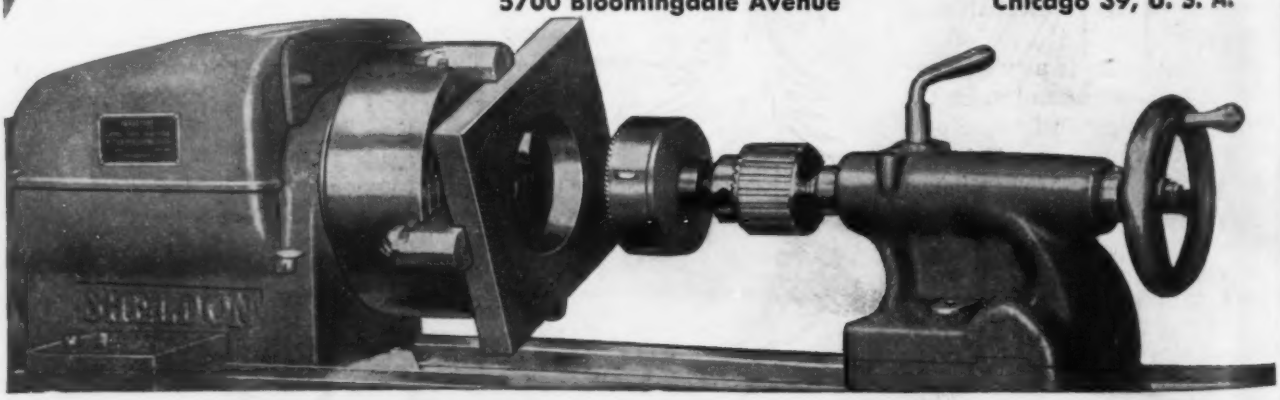
MARVEL High Speed-Edge Hole Saws come in 35 sizes, from ⅝" to 4½". They are carried in stock by leading industrial distributors.

WRITE FOR BULLETIN ST-650

**"MARVEL" *has Always had the edge!***

**MARVEL** *Metal Cutting* **SAWS**
Better Machines—Better Blades

**ARMSTRONG-BLUM MFG. CO.**
*"The Hack Saw People"*
**5700 Bloomingdale Avenue** **Chicago 39, U. S. A.**



# Automation Demands Integral Gaging

**Without built-in, high-precision gages, automation speeds output of faulty parts . . . Must have control instruments in, not on, machine tools . . . Will guarantee accuracy not report it—*By E. J. Egan, Jr.***

♦ THE TREND toward automation of metalworking facilities is already making heavy demands on the ingenuity of precision gage manufacturers. And there are indications that the pace is being stepped up. The reason is clear: Multi-million dollar, fully automated machining and transfer lines are worthless if they merely speed up production of faulty parts.

Machine tool and gage designers have a vision of the "last word" in automatic machining and gaging. It looks something like this. There would be a completely automatic, precision gaging control unit tied in with each machining station in the transfer line. This control unit would perform a dual function: 1. a continuous, in-process check on dimensional tolerances, ending with a signal for part transfer when work is completed at any machining station; 2. a continuous automatic tool adjustment to compensate for tool wear.

**Gage Work In Process . . .** Important thing is that the gaging would be an in-process inspection instead of a check after one or more machining cycles had been completed. Gaging would be so well integrated and calibrated that no faulty parts could be produced. Any trend toward an out-of-tolerance condition would be instantly corrected.

Since design engineers can visualize this ideal precision control setup, they are confident it will eventually become a reality.

Just how soon all this will happen is uncertain. But the pressure is on for the tool builders to add as much practical sales appeal to their products as possible. Built-in, foolproof gaging is one interesting possibility.

**Few Present Applications . . .** There is a fair amount of built-in gaging now in use on automatic machines and transfer equipment. But except for a few cylindrical grinding applications, and possibly a couple in the turning field, present day automatic gaging is not the true in-process type.

For the most part, modern gaging controls produce their warning signals after at least one off-tolerance workpiece has been produced. This is certainly a step in the right direction, and a very broad step away from the idea of post-process inspection of entire lots at some isolated gaging station.

"You engineers never take a shop man's word for anything!"

**Automation Waste Costly . . .** Automation is making cost-conscious production men even more than usually resentful of any waste, be it of time, manpower or material. And uncontrolled part processing to the point of final inspection often means all three. It's a burden in any cost area to complete a full processing on one or more workpieces only to lose them eventually as out-of-tolerance rejects. And it adds insult to injury when the sad discovery is made too late at some remote measuring bench.

Thus it is inevitable that machining and gaging continue to become more closely integrated. The first step was to put gages "onto" the machine tools for a quick, accurate follow-up check. Next big move will be to get the control instruments right "into" the works where they'll actually guarantee product accuracy instead of reporting on it.

**Must Justify Costs . . .** As the techniques of gaging and machine control improve, the problem of diminishing returns begins to show up. Built-in gaging delicately adjusted to do a special or single-purpose job demands long production runs to justify its installation and maintenance costs.

Inevitably, gage designers will face the demand to make their control devices more flexible. Urging will come from jobbing shops and experimental or prototype departments where varied output still requires utmost precision at fast production rates.

# deep-draw metal annealed in seconds... quality improved with continuous annealer

## SELAS CONTINUOUS ANNEALING FURNACE AT SOMERS BRASS CO. PRODUCES FINEST METAL IN RECORD TIME

Brass strip annealing which formerly required hours is now done in seconds at Somers Brass with a new Selas continuous strip-annealing furnace. The new furnace uniformly anneals strip . . . gauge from .004" upward . . . at speeds up to 190 feet per minute . . . allows exceptional flexibility for emergency orders . . . requires less floor space.

The finished brass strip is unique in its fine grain structure and maximum ductility. Deep drawing characteristics are greatly improved . . . complex eyelet shapes can be fabricated with clean-cut die impressions. Easier buffing to a lustrous scratch-resistant surface is made possible with finer grain size. Eyelet men report metal "best yet obtained for lipstick shells."

Selas Thermo-Automation equipment offers you savings in production time and improved quality of finished product. Look into it for heat treating, brazing, forging, metal fusion and other operations. Write for informative brochures on strip annealing.




# SELAS

**CORPORATION OF AMERICA • PHILADELPHIA 34, PA.**

*Heat Processing Engineers for Industry • Development • Design • Manufacture*

# The Iron Age SALUTES

## *Theron R. Palmer* His deep conviction that no company is better than the people who work for it has been a major factor in the growth of the firm that he founded over 50 years ago.

Theron Palmer believes in people. He attributes the growth and success of Continental Rubber Works, Erie, Pa., which he founded over 50 years ago, to the skill and loyalty of the people who worked with him over the years.

He believes a company is no better than the people who work for it. "Skilled manpower," he says, "is even more important to industrial success than machinery. . . . We must train men for leadership, development . . . to carry on."

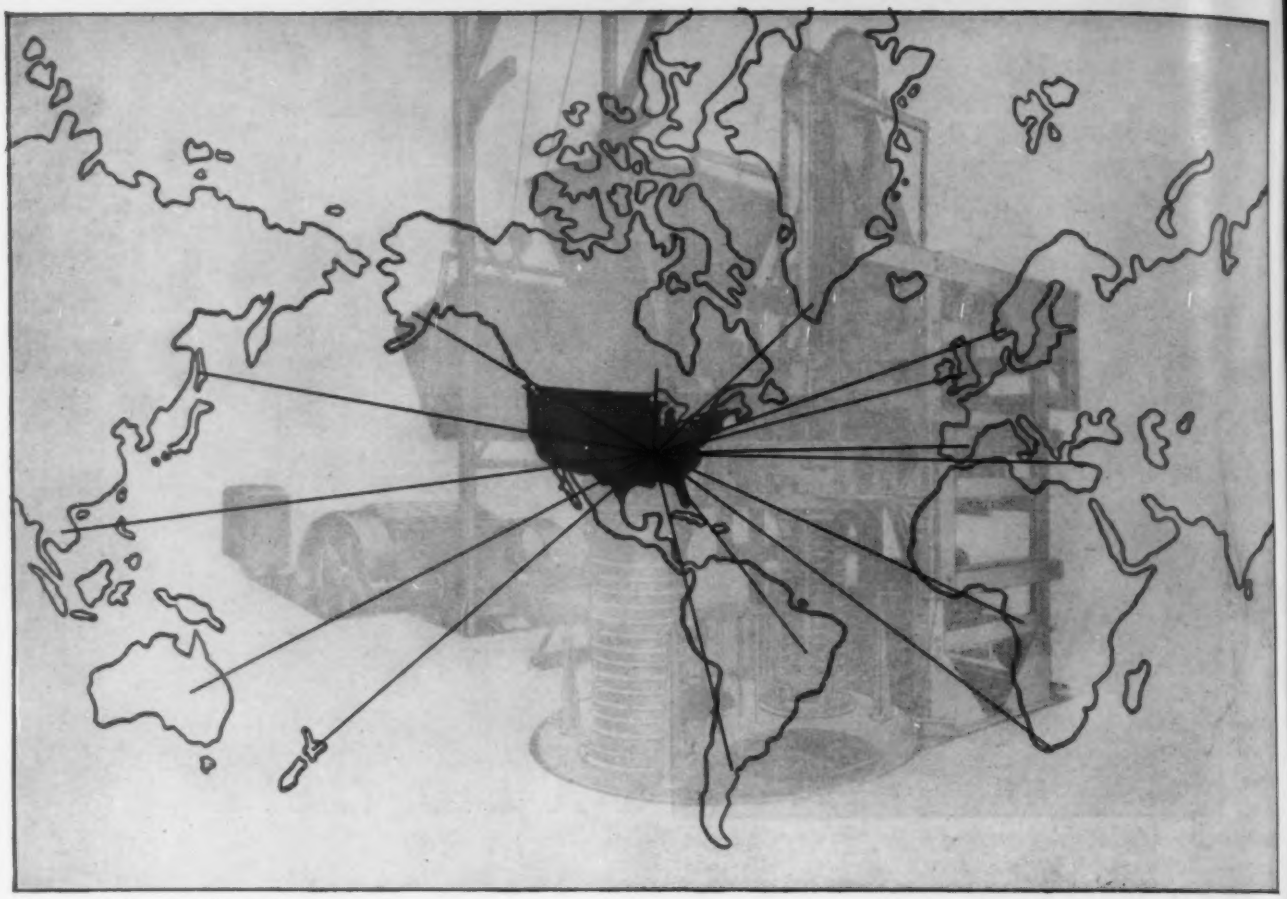
The future has always presented a challenge to Mr. Palmer, now 77 and chairman of the board at Continental. But he has never been frightened by it. When he founded the company after scraping up the necessary capital the wisdom of acquiring much more space than necessary was questioned. But within four years sales and production had increased to the point that space was at a premium.

It's been that way with Continental as it kept pace with mounting requirements for rubber in war and peace—first for such applications at bicycle tires and tubes; industrial hose, and various calendered and molded products; later for automotive, communications, and a host of other industrial applications.

Mr. Palmer came up the hard way. He was only 16 when he took a job with the B. F. Goodrich Co., as assistant paymaster. Later he shifted from office to shop—something almost unheard of at the time—and subsequently he accepted an offer to become general manager of Pennsylvania Rubber Co., Erie, Pa. It was this experience, plus his own ability and enthusiasm that persuaded others to give him the financial backing he needed to get Continental underway.

Mr. Palmer has no hobbies as such. Apart from his deep interest in the business, he likes to relax with close friends and his family.

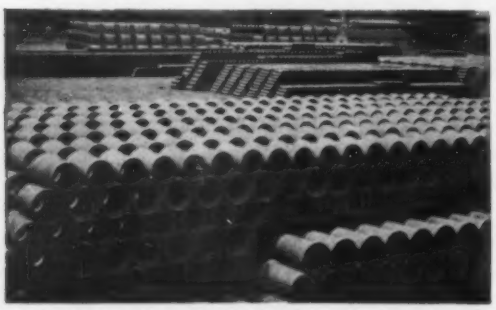
In order to get his infant company underway, Mr. Palmer brought to Erie a group of experienced workmen, many of whom he had been associated with during his formative years in the industry. And most stayed 'til retirement.



*From Sioux City, Iowa:*

# CITIES SERVICE OILS AND GREASES SENT ALL OVER THE WORLD WITH McCRACKEN MACHINES!

"**OUR FINISHED MACHINES** are completely serviced with Pacemaker 2 hydraulic fluid, Optimus 4 oil in the transmission and Trojan M for bearing grease."



**CORRUGATED CONCRETE PIPES,** used for sewer, culvert and irrigation work, are one of industry's most vital tools. McCracken Machines make the very finest.

## ONE CITIES SERVICE PRODUCT SOLD MANUFACTURER ON THE COMPLETE CITIES SERVICE QUALITY LINE!

During the early part of World War II, Concrete Pipe Machinery Co., manufacturers of McCracken Machines, called in a Cities Service Lubrication Engineer for answers to some tough metal-cutting problems. On his recommendation, they tried Cities Service Cutting Oil, Chillo 93. Finished work was so improved and tool life so prolonged, that Concrete Pipe had a complete lubrication survey made of their plant.

THIS CAREFUL SURVEY PROVED THAT THE COMPLETE CITIES SERVICE LINE COULD DO THE BEST JOB FOR THEM. Electric motors, spindles, gear reducers, air compressors . . . drilling, grinding, machining of cast iron parts, threading, tool and die work . . . hydraulic systems, bearings, transmissions . . . Cities Service Industrial Oils, Greases and Cutting Oils did better on every job! Concrete Pipe Machinery Co. says: "They are giving us outstanding service, and availability and delivery have always been excellent."

If you'd like to talk to a Cities Service Lubrication Engineer, write Cities Service Oil Company, Sixty Wall Tower, New York 5, New York, or call the office nearest you.

**CITIES SERVICE**

QUALITY PETROLEUM PRODUCTS

# The Iron Age INTRODUCES

**Marc Bendick,** elected president, Barnaby Mfg. Co., Bridgeport.

**Robert C. Houser,** becomes assistant treasurer, **H. K. Porter Co., Inc.**

**Leo Kelly,** elected secretary-treasurer, **Penn Machine Co.,** Johnstown, Pa.

**William M. Cousins, Jr.,** promoted to assistant director in charge of business operations, **Armour Research Foundation of Illinois Institute of Technology,** Chicago.

**C. C. Lowry,** becomes vice-president—Sales, **Zurn Services, Inc.,** New York.

**William F. Wilson,** appointed vice-president in charge of engineering and manufacturing, **The Gear Grinding Machine Co.,** Detroit.

**Robert G. Matters,** appointed assistant director of research, **Allis-Chalmers Mfg. Co.,** Milwaukee.

**Dr. Charles J. Kensler,** joins staff of **Arthur D. Little, Inc.,** Cambridge.

**Paul H. Mougey,** is in charge of aluminum pigment sales, **Aluminum Co. of America,** New York and Newark district sales offices.

**Robert H. Wilkie,** becomes eastern regional sales manager, New Departure Div., **General Motors Corp.; James P. Gillilan,** becomes assistant to the sales manager; and **Robert E. Randel,** will be in charge of advertising and sales promotion.

**Stewart O. Bailey,** named grinding department foreman, **Norton Co.,** Worcester; succeeding John Cook who retired after 43 years with the company.

**R. E. Fortner,** named eastern area credit manager, Tennessee Coal & Iron Div., **U. S. Steel Corp.,** Birmingham; and **Albert M. Pearson,** becomes western area credit manager.

**E. A. Barnard,** appointed manager, Steel Door Dept., **Ceco Steel Products Corp.**

**Robert A. Canning,** named manager of quality control, Carboloy Dept., **General Electric Co.,** Detroit.

**Francis B. Speaker,** named manager of nonferrous metal mining industry sales development, **Hewitt-Robins, Inc.,** Stamford, Conn.

**Sydney Minault,** promoted to works manager, responsible for the Production and Engineering Depts., Equipt. Div., **National Research Corp.,** Cambridge, Mass.

**Frank A. Ryan,** named general manager, Contractural Engineering Dept., **United Aircraft Products, Inc.,** Dayton.

**Russell J. Hamilton,** named regional sales maanger, **McKinney Manufacturing Co.,** Pittsburgh.

**Edward R. Maddock,** appointed works manager, Decatur, Ala., Works, **Worthington Corp.**

**Walter F. Larson,** appointed chief engineer, **Sutton Engineering Co.;** and **Donald E. Russell,** becomes sales manager, new Hydraulic Equipment Dept.

EDWARD R. ANDERSON, elected vice - president, American Brake Shoe Co.

I. EUGENE COX, appointed vice-president-Engineering and Development, American Brake Shoe Co.

NORMAN BIRCH, named vice-president - Operations, American Brake Shoe Co.

WILLIAM A. HUGHES, named vice - president - Sales, Standard Boiler & Plate Iron Co.

**Christopher T. Kastner** and **J. Benning Monk**, appointed sales managers, Power Transformer Dept., **General Electric Co.**

**L. T. Lincoln**, appointed sales engineer, West Coast area, **Westinghouse Air Brake Co.**

**Byron B. Clow**, appointed branch manager, **Kaiser Aluminum & Chemical Sales, Inc.**; and **Vernon A. McChesney**, appointed manager, field engineering, Chicago headquarters.

**Price Berrien**, appointed general plant manager, **The National Screw & Mfg. Co.**, Cleveland.

**Ross Miller**, named sales manager, **St. Paul Hydraulic Hoist**, Mattoon, Ill.

**Leon Marmon**, appointed sales engineer, Cleveland area, **The Parker Appliance Co.**

**Andrew Liston**, appointed general sales manager, Eddystone Div., **Baldwin - Lima - Hamilton Corp.**, Philadelphia.

**Willard Haas**, named technical manager of hose, **The B. F. Goodrich Co.**, Industrial Products Div., Akron, Ohio.

**Lee R. Herring**, appointed sales engineer, Maryland, Virginia and District of Columbia territory, **The Hitchiner Mfg. Co., Inc.**

**James A. Robertson**, assigned to the Sales Dept., **Toledo Steel Tube Co.**

**A. McLean Freeman**, appointed advertising manager, **The Permutit Co.**, New York.

**Thomas J. Corbett**, appointed production engineer, Heating Research Section, **The National Radiator Co.**, Johnstown, Pa.

THOMAS F. CASSIDY, appointed manager, Albany branch factory, Fruehauf Trailer Co.

ROBERT W. WALSH, appointed sales manager, Jones & Laughlin Steel Corp., New York warehouse.

FRANK J. MONAGHAN, new sales manager, Explosives Div., The Olin Mathieson Chemical Corp.

EUGENE MOWLDS, JR., appointed general contracting manager, U. S. Steel Corp.'s American Bridge Div.


# Investigate WSM Stampings *First!*

Before you complete your plans for that new product — or for re-design of the old one, investigate the cost-saving advantages of WSM stampings. They are designed to incorporate light weight, strength and economy . . . features essential to today's component parts.

WSM equipment includes over 100 presses . . . semi-automatics to 1000 ton pressure . . . WSM delivers stampings on schedule . . . in large or small shipments, as needed.

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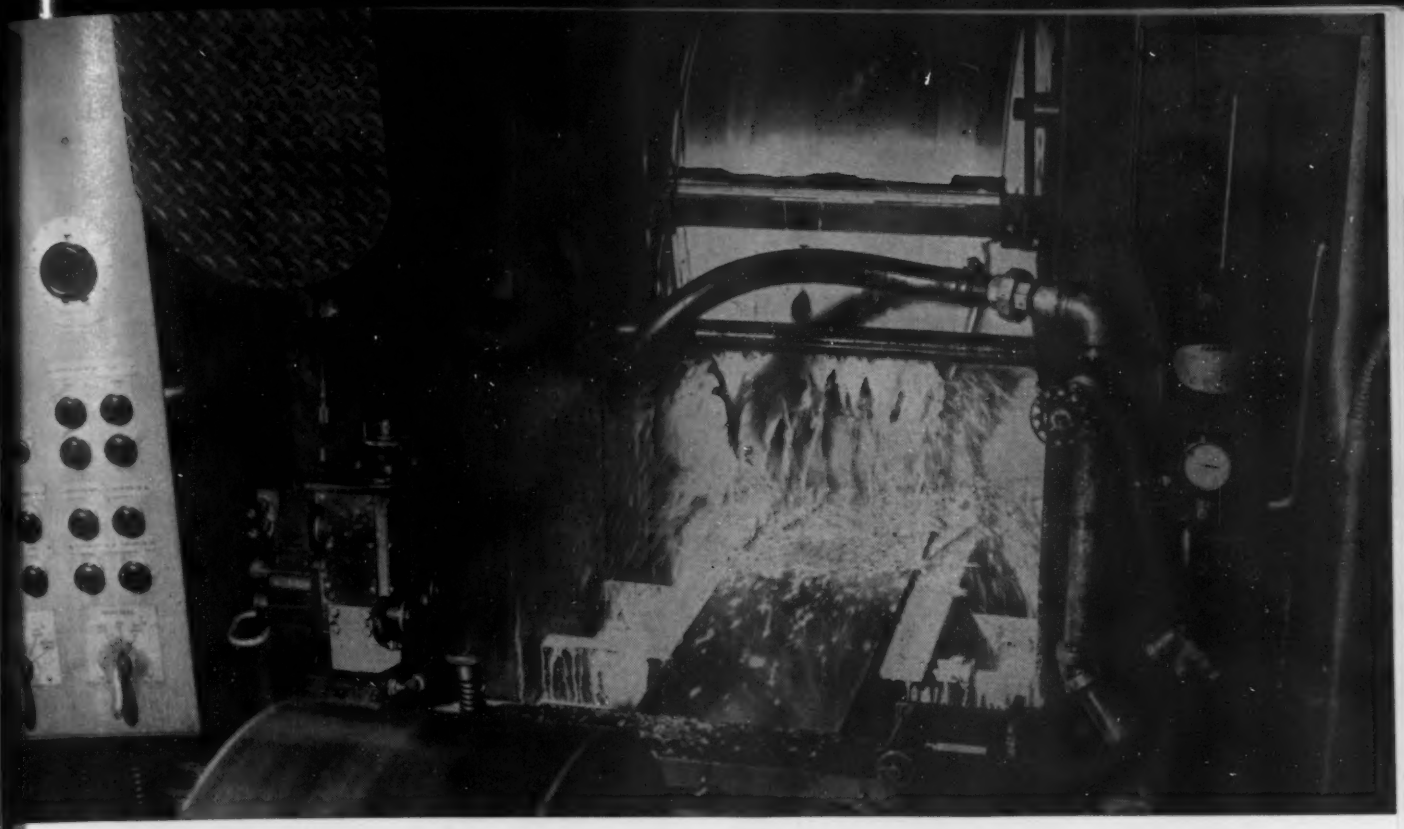
*Write for descriptive folder . . . or, let our representative call in person . . . without obligation.*

**WORCESTER STAMPED METAL** *Company*

10 HUNT ST., WORCESTER, MASS., U. S. A.

SPECIALISTS IN SKILLED STAMPING SERVICE



# NEW SUNOCO EMULSIFYING ROLLING OIL EASIER TO USE, LASTS LONGER

ixes readily in hard or cold water—forms whiter and more e emulsions that can be used for a longer time. The lower osity of new Sunoco Emulsifying Rolling Oil makes it r to pump from storage tanks. These improvements are result of improved refining techniques made possible by ral new multimillion-dollar refining units.

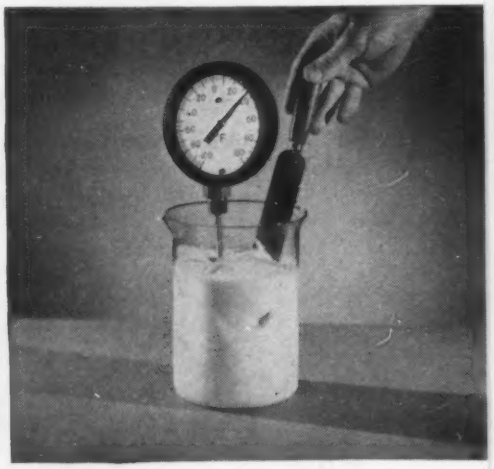
sers report cleaner rolls, reduced spalling, and absence of ming. The result is lower power consumption and higher speeds—as much as 50% in many cases. In the annealing operations, Sunoco Emulsifying Rolling Oil burns off cleanly—usually making cleaning unnecessary. All of these advantages contribute to lower cost operation.

You can also use Sunoco Emulsifying Rolling Oil advantageously for rust proofing hot rolled sheets after pickling, and as a die lubricant in cold drawing steel bars.

The full story about this new oil is well worth your listening. Care to hear it? Just contact your Sun Oil Company representative. Or write Dept. IA-9.

## STS SHOW HOW EADILY THIS NEW IL FORMS STABLE MULSIONS

RD WATER—Tested in dozens of sam- of water obtained from industrial plants ng hard water problems. Never failed to a stable emulsion.



COLD WATER—Forms a stable emulsion in the coldest water . . . even ice water.

DUSTRIAL PRODUCTS DEPARTMENT
UN OIL COMPANY

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*de by the refiners of famous Blue Sunoco Gasoline and Dynalube Motor Oils*

need a finish for low cost corrosion protection or showroom sparkle?

specify IRIDITE®

Whether you're finishing non-ferrous parts for high corrosion protection, paint base, or for showroom sales appeal, you can be sure of low material and production costs and peak performance when you specify Iridite. Here's what you can do with Iridite:

**ON ZINC AND CADMIUM** you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

**ON COPPER . . .** Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

**ON ALUMINUM** Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

**ON MAGNESIUM** Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

**AND IRIDITE IS EASY TO APPLY.** Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

**WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.**

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Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals, ARP Plating Chemicals.
WEST COAST LICENSEE: L. H. Butcher Co.




**Warren J. Scholl,** appointed advertising and merchandising manager, **Bonney Forge & Tool Works,** Allentown, Pa.

**G. W. Lawrence,** becomes special sales representative, **National Screw & Mfg. Co.,** Cleveland.

**V. A. Hillman,** appointed exclusive sales and service representative, Washington, Northern Idaho and Alaska, **Lewis-Shepard Products, Inc.**

**W. H. Jones,** appointed representative in southern New Jersey, Delaware and Virginia, **The Cushman Chuck Co.**

**Lee D. Phillips,** appointed sales representative, Philadelphia - New York territory, **The Columbia Steel & Shafting Co.**

**John C. Mackey,** becomes sales representative, Phoenix office, **Kaiser Steel Corp.**

**A. C. Towne, Jr.,** appointed representative for the upper New York State area, **Ajax Electric Co.,** Philadelphia.

## OBITUARIES

**George L. Detterbeck,** 80, founder and president, **George L. Detterbeck Co., Inc.,** Chicago.

**Walter K. Shaw, 64,** former vice-president and treasurer, **Turner Construction Co.,** after a long illness recently.

**Joseph E. Terrill,** 44, district manager of sales, St. Louis office, Reliance Steel Div., **Detroit Steel Corp.**

**Joseph F. Brehl,** 47, sales engineer, National Alloy Div., **Blaw-Knox Co.,** Pittsburgh, of a heart attack recently.

**Hyman Goldburg,** 52, director of sales and service, Parker-Kalon Div., **General American Transportation Corp.,** New York, after a short illness recently.

# Stampings— Should You *Make* Them or *Buy* Them?

By C. C. Caditz President, Northern Metal Products Co., Franklin Park, Ill.

◆ Every metal stamping is bought . . . A frequent—and costly—misstatement is "Yes, we use stampings but we don't buy any."

◆ Here the president of an important contract metal stamping company lays down the gauntlet in the "Make" vs "Buy" argument . . . He claims the issue has been clouded by "patterned" thinking . . . suggests a reappraisal of the subject on a basis of facts, not theories.

◆ If you use stampings and can at least agree with his statement that track records are not set at company picnics you should find it worthwhile.

◆ THE COST OF A STAMPING, whether it is made or bought, depends upon how good a buying job is done. If a buying transaction is involved a *make* or *buy* comparison is possible. First, what are we buying? Just this:

*The right part—at the right time—in the right quantity—at the lowest cost.*

There are some reasons for *making* which in themselves are so basic as to eliminate any necessity for a *make* or *buy* decision. There are projects which are so hush-hush that every production process must be controlled in the interest of secrecy. Or, some requirements are so complex and demand such a tremendous capital investment that the normal competitive advantages of having a choice of many sources would not exist for the customer. An end product manufacturer can assume large special machinery investments and project them over many years of use.

But such valid reasons do not back up most *make* decisions. Too often they are based on comments like:

"Punch presses? They aren't expensive—let's buy one."

"Hell, let's make those parts here—the presses in my department aren't doing anything."

"These stampings are going to take real tolerances. We'll just have to make them ourselves."

"I don't care how low the prices are, we can save the supplier's administration and sales expense and make his profit, too."

"We've got to do our own stamping—we can't afford to have our production lines stopped."

Or the President looks out of his window, sees his supplier drive up in a new Cadillac, and decides that making stampings must be profitable.

## IN THIS CORNER . . .

In "*Make* can Lick *Buy*" and vice versa comparisons *make* has been the popular favorite over the last few years. In fact, many executives regard the fight as "No Contest."

Too often, however, the fight has been fixed. That condition doesn't lead to developing good fighters or determining the better man. It usually costs the bettor money.

Most companies recognize that there are some costs involved in *making*. There is little

disagreement on including direct labor and raw material items but wide differences when it comes to the variable and fixed costs.

Many manufacturers do *not* include their full, or any of their fixed costs on the theory best expressed in the question "After all, we have them anyhow, don't we?"

Here's General Electric Co.'s answer to that. It's in the form of a quotation from a letter written by L. D. Miles, Manager of G. E.'s Value Analysis Unit—Material and Purchasing Dept., Schenectady:

"It was logical when a ready market existed for any reasonable quantity of our products which we could produce to reckon our costs as we have, to figure that, if we had a machine which was not working, the overhead costs continued anyway and we should make certain sacrifices to keep all of the machines busy. It was logical then, in considering whether to make or buy a part, to compare the purchase cost of the part with the sum of material plus variable overhead rather than full overhead because the fixed overhead would continue even if the part were purchased and would, in effect, be an added burden on other parts of the device.

"It is just as logical now, as we face a competitive market, to accept the fact that the value of a part or component or material is established by the lowest cost at which it can be dependably provided where and when needed whether it be provided from our own machines or from the equipment of specializing vendors. . . .

"It then becomes basic under today's competitive conditions that every part or component in our product stand on its own feet and represent the best value obtainable in the market whether that value results from little or much work on the part in our company.

"Following this basic competitive conception, it will be found that machines in our own factory which do not competitively, considering full overhead—shop cost vs. purchase price, deliver parts and components to our assembly lines at value, will become idle.

"At first glance, this again appears contrary to self-interest—it appears to result in a shifting of the fixed overhead and increasing the cost of other parts while admittedly it accomplishes the objective of providing a specified part or component at its value.

"A second look shows that soon this and other machines which are indeed marginal or sub-marginal operations but have not necessarily been recognized as such in the past due to our former policy of keeping them busy, are standing idle. The management then will strip out these marginal and loss machines and put in their place profit making operations. In innumerable such cases, we have found this space adequate to meet our needs for increased production.

"We think that, in today's competitive market, we must hold one thing inviolate; namely, the costs of the various parts, components, and materials which go into our product must not go in at prices higher than our competitors would pay for identical parts.

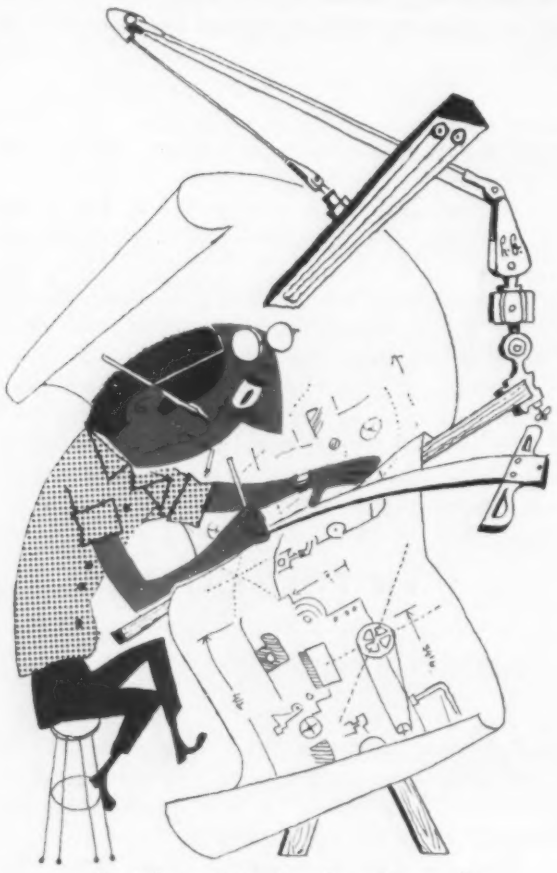
"Taxes of all nature are becoming extremely high and the difficulty of getting large amounts of capital for new buildings, and of liquidating those expenditures once made, are becoming increasingly difficult. It is accordingly sharpening our wits in decisions regarding marginal operations.

"Cost determinations for the purpose of "make-it or buy-it decisions" are based upon the comparison of the sum of "material" and "labor" with the value of the part as established on the market.

" 'Material' is the actual price which would be paid for the material.

" 'Labor' is the actual amount the workman gets *plus full overhead*.

"Unless the part can be manufactured for its value as determined by this direct comparison, it is provided by purchase."



"It takes a lot of engineering . . ."

This approach takes into consideration that when you *make* and try to fool the buyer you are only fooling yourself.

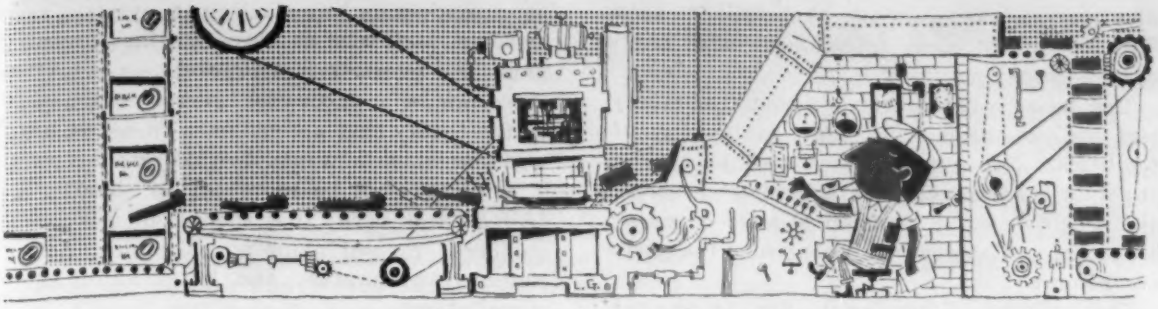
When a part is *made* the purchasing department—the buying expert—is usually left out of the picture. Often no one else steps in to do the buying job.

Once a press is set up and the operation becomes an incidental part of a larger operation the justification for its existence is often overlooked. There's nobody around constantly asking, "What are we paying for the operation? What are we getting for that cost? Can we buy it for less?"

As market or other conditions change a purchasing department does just that on the *buy* decisions. The price on the bought part is always under control.

The four-minute mile was run because of competition. New lows in cost are reached the same way.

On every new part—and sometimes even on new releases—the purchasing department makes the supplier race for his prize. He has to prove himself every time. It is impossible —even with the best of intentions—for a cap-



"Technological miracles are not always justified by the end result."

tive stamping operation to be so competitively whipped and controlled.

Track records are not set at company picnics.

That loss of control and competition should be a major factor in the decision: *"Make or buy."*

Under a reduced volume of business a big job is to get the break-even point down. Yet you will hear the statement: "Buy stampings? Don't be crazy. We're pulling in all the parts we've got farmed out now. We've got a big capital investment and we've got to absorb our overhead."

It sounds good only if you say it fast enough.

Eliminating the luxury of a captive press department might be the more logical approach to a serious break-even point reduction program. Here's why: Depreciation on equipment and rent or depreciation on buildings would be eliminated; general insurance costs could be decreased; workman compensation rates would go straight down; supervision could be eliminated; die repair and machine repair expense would be disproportionately reduced; factory expense items would melt and a mass of handling costs would disappear.

In addition, fixed assets and inventories could be converted into cash and working capital ratios improved. This always looks good on a balance sheet.

### Patterned Thinking

Remember, too, that any general drop in business usually results in lower prices in the highly competitive contract stamping field. This could make comparisons even worse.

In a *make* situation can savings be effected where the largest costs are—in labor and material?

The end product manufacturer can save in labor costs only by paying a lower hourly rate or by producing the part with less labor. In his interviews the writer found that the hourly rate paid to press operators in plants where stamping was incidental had nothing to do with the going market price for punch press operators. It was almost always based on the hourly rate of the main body of employees in the plant. This ran as high as 25 pct over the prevailing rates paid in stamping shops.

Where an end product manufacturer does not go into an expensive single purpose special machine set-up it is not reasonable to suppose he can out-engineer a whole field of specialists on the general run of stampings. In other words, he is not likely to make the part with less labor hours.

It takes crane operators; die setters; stock-handlers; machine repair men; die repair men; inspectors; and other types of labor to keep press operators effective—in any plant. The control of that indirect labor is tremendously important to the overall cost factors.

That control, as expressed in daily reports showing ratio of indirect to direct labor hours; ratio of die repair hours to press time; daily percentages of operator efficiency; machine load reports and other reports of that type, is not likely to exist in a diffused situation. In contract stamping none of those figures is hidden. They are recognized as part of cost.

Major differences in raw material costs are unlikely. Prices generally will be at mill levels. However, where an end product manufacturer might use only a small amount of some gage and be buying it at a higher than mill basis the contract stamper might be pricing at mill due to his general accumulated requirements.

Pulling in stampings because of patterned thinking may raise break-even points rather than lower them. It can be as unreal an approach as was that of the pensioner who for years had the job of polishing the town cannon. When in an economy move the job was cut out, the old man in high temper sputtered, "Let them do it . . . I'll buy my own cannon."

## WHO'S WHO . . .

There was a time, when autos were young, when a manufacturer had no choice but to make his own parts when he needed them to close tolerance; or he needed particularly large parts; or where his company's existence depended on a daily flow of tremendous quantities of parts.

But, because of advantages of specialization, there grew up in the United States several thousand contract metal fabricators. Within this field a manufacturer can find competitive sources of almost anything he needs—automatic production of millions of pieces at pen-

nies per thousand—shops that will make a few pieces—intricate assemblies—close tolerances—almost anything.

The decision to *make* or *buy* should normally rest on something other than availability of facilities. Not every source available to a buyer is a contract metal stamping specialist and whether a *buy* decision is a good one or not might well depend on from whom the parts are bought.

The validity of arguments for or against *buying* must take into consideration whether or not the source is a true contract stamper. That means that his entire organization is devoted exclusively to contract stamping — not using stamping as a fill-in or sideline.

It isn't only the fact that a manufacturer doing stamping work incidentally might put other requirements first that makes him a less desirable source. It takes more than punch presses to give a customer the right part—at the right time—in the right quantity—at the lowest cost.

To make the part right takes engineering and inspection; to ship it at the right time takes scheduling and controls; to ship the right quantities requires inventories and space; to know costs requires systems and accounting.

Contract metal stamping shops must be geared for such service mentally and organizationally. A contract metal stamper wouldn't consider closing his plant down for a week or two-week vacation period—no matter how attractive such a move might be costwise.

Even when business is at a very low level a contract stamper keeps a night shift; he needs it for the fast passes—for the guy who's got a production line starting at seven the next morning and who at three in the afternoon finds he's overlooked a bracket.

"In MAKE vs. BUY the former has usually been the favorite but the fight has been fixed."

A stamper's paperwork system is designed on the theory that no customer knows what he wants or when he wants it—that an order when it is placed will be increased in quantity or decreased or both; that there'll be new issue numbers; revised shipping schedules; holds; engineering changes; and, after all of that, cancellations.

And a contract stamper is ready to give quick cost estimates.

## LOOK, MA, NO HANDS . . .

When fashion decrees that skirts be worn short women will wear them short despite bowlegs, piano legs, or spindly legs. There are fashions in industry, too, which have a tendency to be followed willy-nilly.

Automation is the magic word today. The production ideal is to feed raw material in at one end of a machine and have finished parts flow out the other end—untouched by human hands. But technological miracles are not always justified by end results.

Not too long ago a manufacturer built a tremendous and complex die for making radio chassis automatically. The theory was fine but did not take into account the normal flood of engineering changes and the need for die removals which automation made more difficult. Finally, to meet his production requirements, he purchased these chassis from a contract manufacturer. The latter retooled the chassis in a manner more consistent with the objective —"The right part—At the right time—In the right quantity—At the lowest cost."

Special purpose machines have another, sometimes less visible, disadvantage. To illustrate: A manufacturer sets up a line of punch presses to stamp out a series of parts. Along come new parts which can better be made on larger presses. At this point the tendency is to design and make the operations on the equipment available. That can be done but it could result in not making the parts in as few operations as possible.

Human nature and complex organizations being what they are, that sort of condition is extremely difficult for company management in a "make-it-ourselves" condition to pin down and correct. A company that farms out such work has a choice of a tremendous range of facilities. If one contract metal stamper does not have the best suited equipment another will.

The writer received a memorandum from his sales department which dramatically illustrated this point:

"We have just had a chance to observe some of the methods used by a captive press shop. We were asked to quote on the stampings for the ABC Automobile Co. auto radio. This contract had been running at the XYZ Radio

Co. for a number of years. They have their own stamping department.

"The quoting was done in two phases: (1) Parts and tool costs were to be established from piece part drawings supplied by the ABC Automobile Company. (2) Part prices were to be established from operation sheets supplied by the XYZ Radio Co. based on the tools in their plant.

"In checking the first set of figures against the second an extremely wide variation was seen. Because of basic differences in operations the parts quoted from scratch were cheaper than the prices from the radio manufacturer's existing tools. The XYZ Radio Co. has more operations than necessary.

"In discussing this with XYZ engineers we found that their part design was tied into their equipment. They had extra operations because they didn't have the presses to do the work any other way."

## LET'S FEEL THE MATERIAL . . .

In any discussion on *make* or *buy* there is a one-word argument which is tossed in as conclusive: Quality. It's the clincher.

This is the most difficult of all points to discuss. It can become as unanswerable as the word "Because."

It is easy to imagine a situation where standards of finish or tolerances are so abnormal that the manufacturer would have no real competitive market in which to shop. That point, however, is used to justify a *make* policy on parts with average quality requirements. Even when it is pointed out that a direct competitor is *buying* the answer is, "Well, our quality standards are higher."

That is not a logical, nor generally a truthful, conclusion. Control is less absolute when a part is *made*. If the part varies from specification, but is usable, there is a natural reluctance to throw it out or to rework it. Why create more production problems; more indirect labor; more tool room time; more set-ups; and more costs for yourself? John and Joe are fellow members of the profit sharing plan—remember?

### Rejects are Expensive

If a contract stamper ships a part that isn't up to specifications he gets it back.

Spoilage and rejects are expensive. They are items easily hidden and overlooked in a cost analysis when the part is *made* and the costs are in suspension throughout the organization. When you buy a part the cost of quality is absolute. You pay only for good parts.

When higher quality standards must suddenly be imposed it is easier to find a new contract stamper with the necessary quality standards than to try to raise—or lower—quality standards in your own plant.

Incidental press operations in a plant can lower the quality of a product. Presses are noisy; they can distract other workers.

Generally speaking, "quality" is a weak argument for *making*.

## LET'S PLAY ENGINEER . . .

There is a belief, widely held, that metal stampers don't have to do any engineering and so have no engineering expense. But "getting the right part at the least possible cost" takes a lot of engineering whether the stamping is made or bought. It takes engineering for part design, die casting, and the estimating of die costs and part costs.

An end product producer needs and deserves that service when he buys a stamping—whether from his own plant or a contract stamper.

Many manufacturers regard this engineering service as available "for free." Perhaps this is because manufacturers tend to regard the stamping company representative as a salesman rather than as an engineer even though he may be working daily with their own engineering and production departments on design and mechanical problems.

Traditionally, too, much of the engineering in the form of operational sequences, die costs and part cost estimates is "free" All you have to do is make a sketch or a print and write "Kindly quote" on the face of it. If anyone is ever going to be killed by kindness it will be the metal stamper. That "Kindly quote" will do it.

For instance, the head of an in-plant fabricating department confronted the purchasing agent who had requested cost estimates from him. He had submitted no quotations but wanted his company's work on the basis of the prices the purchasing agent secured from contract stamping sources. "Hell," he said to the buyer, "you're not going to stick us with the big cost of estimating—are you? Why burden us?" Value determination and cost determination are two different things.

Tooling is another phase of stamping engineering. A contract stamper usually has a large die shop. He needs it to build new dies and maintain those in production. In the fields in which he has a lot of experience the contractor stamper develops special die construction skills. A stamper regards his tool shop as a means to an end. He generally prices his tools at a cost figure.

A lot of valuable engineering is included in the contract stamping price. It is less likely to be in the package if the manufacturer buys his parts from companies not contract metal stampers. It is less likely to exist where the stampings are bought on an emergency or peak load basis only. It becomes an important plus factor where there is a close relationship between the customer and the supplier.

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**WORTH READING**

"Make or Buy," J. W. Culliton, Harvard University School of Business Administration, Boston. $1.50.
"Creep," R. L. Dixon, Journal of Accountancy, July, 1953.

*By replacing cams—*

# Flexible Electronic Controls Improve Gear Lapping Operations

W. G. Patton Asst. Technical Editor

◆ Versatile, accurate electronic controls replace mechanical camming on new high production gear lapping machines used at Buick . . . Preset backlash control improves hypoid gear set quality . . . Cam elimination means less downtime for machine readjustment.

◆ Quick settings with dial controls accomplish change of throw in any direction . . . Tooth surface refinement means long service life and quiet operation of gear sets . . . Other new features insure control of constant brake power, positive clamping of gear and pinion during the lapping cycle.

◆ PROVIDING GEAR SETS for the more than half million passenger cars Buick Motor Div. will produce this year requires the use of a large battery of high production lapping machines. Now, electronic controls used on the latest Gleason machines have provided better quality control of finished gear sets, higher production rates, and eliminated considerable downtime. Previously, it was necessary to shut down a lapping machine to change the mechanical control cam. Any change in specification meant developing completely new, hardened cams.

The No. 19 Hypoid Lapper is an entirely new machine for lapping hardened spiral bevel and hypoid gears and pinions operating at 90° shaft angle. The greater flexibility of the new machines is being used to good advantage in production of the three gear ratios offered to Buick owners. While individual machines are usually fixed to produce a single gear set, adjustments can be made in only a few minutes if product requirements should change.

Using the established lapping principle in which the mating gear and pinion are run together under light load while a mixture of abrasive compound and oil is pumped on the gears, the new machines provide optimum production per square foot of floor space.

During the lapping operation, the relative position of the gear and pinion is changed automatically. The entire working surface of the gear teeth is lapped. By accurately refining the tooth surface, long service life and quiet operation of gear sets is assured.

A feature of the new machines is the preset backlash control. Once correct settings are made, each pair of gears of a production lot is lapped with the same backlash throughout the lapping cycle. This eliminates the human element and also contributes to the accuracy of the new machines.

During the lapping operation, the position of the gear is changed automatically in the three directions necessary for accurate toe, center and heel bearing. This is accomplished by a primary vertical motion from which the other motions are derived by a system of links, rollers and riders. This arrangement completely eliminates the need for cams. Required change of throw in any direction is accomplished by a simple re-adjustment of dial-operated controls.

When the machine changes from reverse to

forward side lapping, a set-over feature provides a means of automatically shifting the position in the directions desired. This permits lapping in the proper position for either side of the tooth.

Change gears have been eliminated in the latest Gleason machines. The speed of the oscillating drive motor is set for forward or reverse by two simple dials. A wide range of oscillations is provided. The number of oscillations is determined by a counter, and the time per side results from the combination of number of oscillations and the speed of the oscillating drive motor.

### Brake is adjustable

An electric drag brake provides a completely new and highly effective means of controlling the constant brake power. The brake can be adjusted to different loads for reverse and forward sides.

Hydraulic movement of the pinion drive head into and away from the normal operating position is actuated by a single control lever. A hydraulic chucking device furnishes positive clamping of both gear and pinion during the lapping cycle. An accumulator eliminates the necessity of having the hydraulic motor operate continuously.

Spindles are mounted on matched antifriction ball bearings.

A calibrated dial permits setting the head to 0.001 in. The driven or gear head is mounted on a column which permits vertical adjustment, either above or below the center line of the pinion or drive spindle. Adjustment is by means of a crank handle and adjustment screw. The control dial is graduated to show 0.001 in.

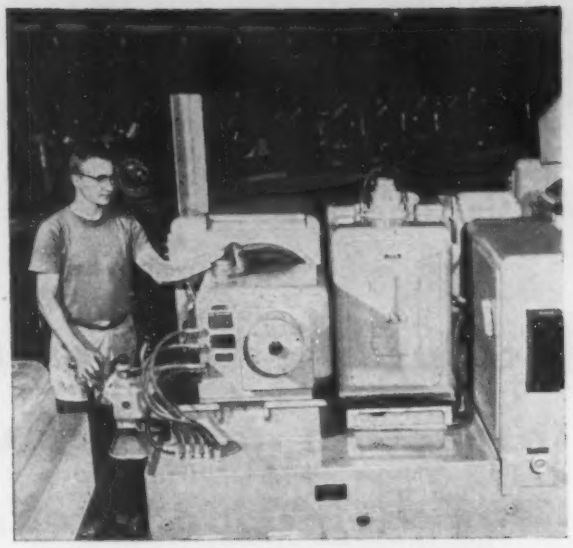
Main drive of the new machines is provided by a 2½ hp, 900 rpm, 5 hp, 1800 rpm 2-speed motor. Three smaller motors are used for oscillation of the gear spindle, driving the lapping compound pump and furnishing power for the hydraulic unit.

### Seals protect spindles

Safety features include the use of a guard to protect the operator. The guard closes automatically when the start button is pushed and is equipped with a hydraulic dampener to safeguard the operator. The guard will not close, however, if the preset back lash lever has not been operated.

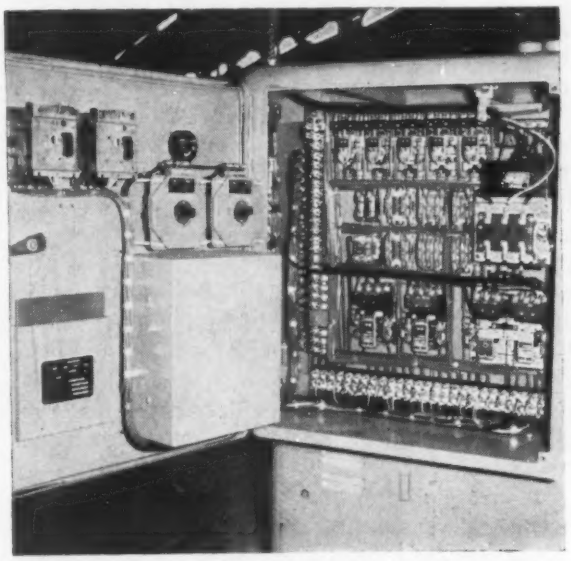
The gear set being lapped is entirely enclosed and diaphragm-type seals effectively protect the spindles from the lapping compound.

After the lapping guard is closed, the compound pump starts and the gears are lapped automatically. At the conclusion of the lapping cycle, the supply of lapping compound shuts off before the gears stop spinning. Thus the gears are removed from the machine relatively free from lapping compound. The guard opens automatically at the end of the cycle.



ELECTRONIC controls permit quick, accurate setups for high production gear lapping.

MATCHING gear and pinion sets are run under light load in a mixture of abrasive and oil.



QUICKLY adjustable electronic controls save time in meeting three gear ratio requirements.

*Isometric drawings help—*

# Acceptance Standards for Magnetic Inspection Improve Quality, Lower Rejection Rates on Critical Parts

By Stephen Maszy Senior Metallurgist, Convair Div., General Dynamics Corp., Fort Worth, Tex.

◆ Magnetic indications produced by inclusions in mild steel and nonstructural parts are usually not considered defects . . . However, they may prove to be a deciding factor in service life when heat treatment is high and parts are critical in nature . . . To determine whether inclusions present in a part will be harmful, a standard method of interpreting magnetic inspection results is desirable.

◆ Over-cautious inspection often results in scrapping acceptable parts because of a few minor inclusions . . . At Convair, Fort Worth, standard acceptance limitations have been established on the size, quantity and location of inclusions found in various parts . . . Part drawings showing where inclusions cannot be tolerated aid inspectors in determining the part's acceptability . . . The system is paying off in higher quality and fewer parts rejects.

◆ MAGNETIC INSPECTION is one of the most widely used methods of locating inclusions, cracks, seams, laps and other defects in ferromagnetic alloys. Generally, inclusions are not considered as harmful defects. However, where heat treatment is high and parts are critical, inclusions may affect service life.

Interpretation of quality with respect to magnetic inspection has been simplified at Convair-Fort Worth with standard acceptance limitations on size, quantity and location of inclusions in parts depending on applied stresses.

Magnetic "indications" referred to here are considered as inclusions unless otherwise stated. Indications produced by inclusions may be questionable from the standpoint of quality. Cracks, seams or laps, however, are readily distinguishable, and are considered grounds for rejection regardless of number and size unless readily removable.

A part planning sheet enables inspectors to distinguish processing defects from nonmetallic inclusions. In a case of doubt an indication is considered a crack, seam, lap or an inclusion until otherwise verified. All parts containing

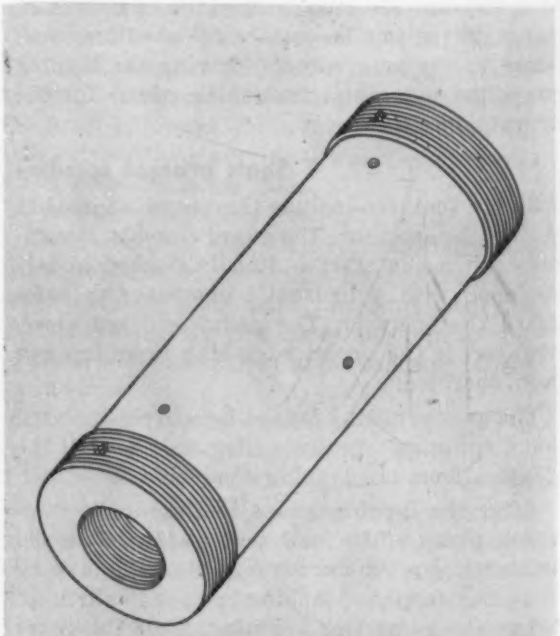


Fig. 1—Inclusions up to 1/2 in. are acceptable in steel pin provided no two inclusions are in line.

cracks, seams, or laps are rejected and sent to a material review board which determines whether the part may be salvaged.

A committee representing engineering, inspection, metallurgical process control and manufacturing departments was formed to draw up magnetic inspection acceptance standards. To obtain "clean" steel, electric furnace steel with an inclusion rating of three or better was used.

Although it was believed that clean steel would not contain detectable magnetic indications, tests showed that a steel may be "clean" but still show indications. Therefore, standards for individual critical parts are maintained.

Standards consist of isometric drawings of each steel part. These are catalogued in a standards manual containing general notations applying to all magnetic inspection procedures. Provisions include: (a) Magnetic inspection used should be of the wet continuous method; (b) All parts are to be demagnetized between each successive magnetic operation; (c) All parts are to be cleaned after each magnetic operation; (d) Any defect other than those shown as acceptable shall be basis for rejection.

Fig. 1 shows a steel pin which is easily seen from the drawing. Stresses tend to bend this part. Therefore, grain flow and inclusions are in tension. Because of this, inclusions are acceptable up to ½ in. in length provided no two inclusions are in line.

Small inclusions parallel to the grain direction are not necessarily harmful. It is necessary, however, to limit the length and number to a certain extent to preserve the quality standard of the part. Tests showed that small inclusions in limited numbers are not detrimental.

All standards give the method and current necessary to reveal harmful inclusions. Standardization of current and method of inspection assures the reproducibility of indications by all inspectors and lowers the possibility of locating "false" inclusions. All parts are inspected by both longitudinal and circular methods.

Parts having internal and external threads may be loaded differently in various sections and require different interpretation of inclusion content. Fig. 2 shows a part having variation in stresses throughout. This variation is shown by shaded and nonshaded areas. The shaded, extremely critical area of this part must be free of inclusions. This part has a tendency to turn inside out, thereby placing the stresses perpendicular to inclusions which are normally parallel to the axis of the part. In a sense this places the inclusions transverse to the stress. Transverse inclusions are undesirable, especially at points of high stress concentration.

Inclusions in the first few threads are in the area of high stress concentration. In areas where the stresses are held to a minimum, inclusions are permitted providing the inclusion does not extend over two threads.

In other parts, there are areas more critical than others and the presence of inclusions is reason for rejection, see Fig. 3. Shaded areas show where stresses are concentrated and inclusions are undesirable.

Designating certain areas to be free of inclusions increases the overall quality of the part since inclusions are usually found throughout the part in about the same distribution.

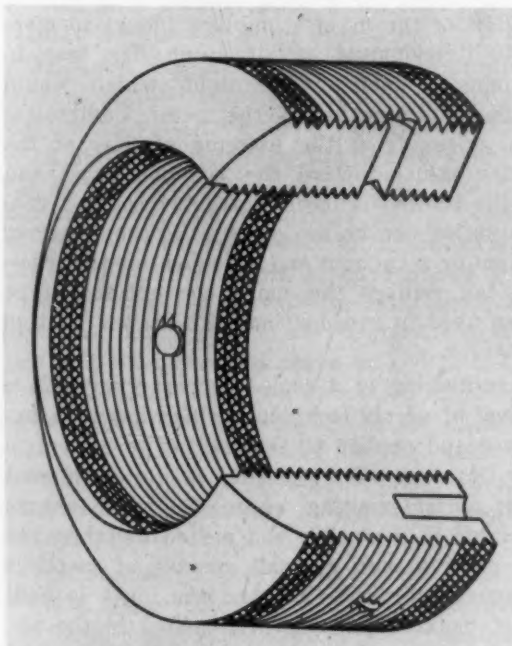


FIG. 2—Acceptance standard calls for no inclusions in shaded area, specifies size elsewhere.

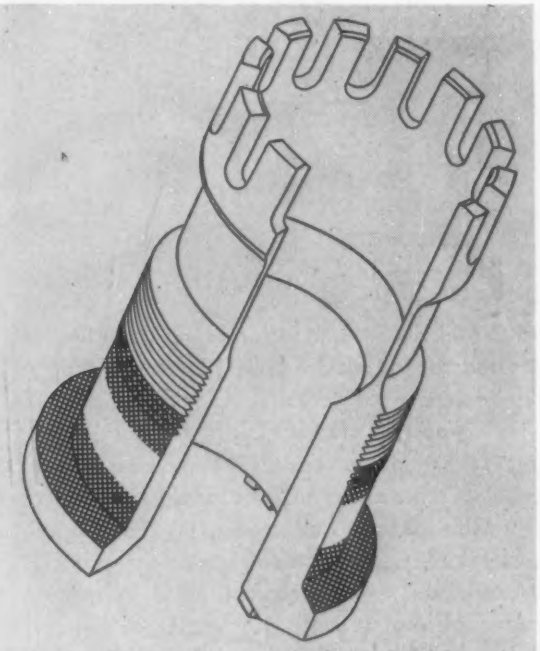
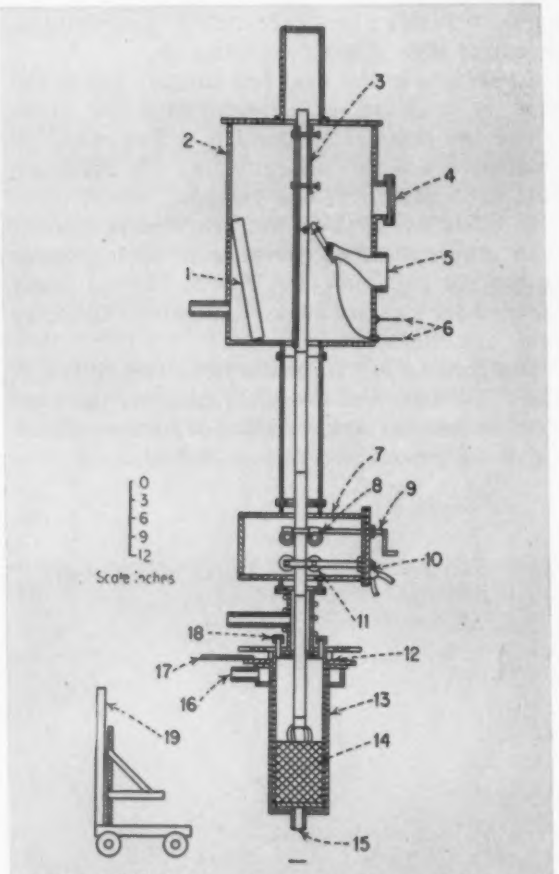


Fig. 3—Shaded areas show stress concentrations where inclusions have proved undesirable.

*95 pct recovery—*

# Double Melting Technique Improves Homogeneity, and Purity of Zirconium and Titanium Ingots

By G. L. Miller Research Manager, Murex, Ltd., Rainham, Essex, England




ARC-MELTING furnace for primary melting of pressed sponge electrode. (1) Electrode supply; (2) Vacuum tight tank; (3) Aligning guides; (4) Viewing port; (5) Rubber glove for bar joining; (6) Welding power leads; (7) Drive box; (8) Mechanical drive rolls; (9) Crank for electrode drive; (10) Main power to electrode; (11) Power application rolls; (12) Electrical insulation ring; (13) Waterjacket; (14) Zirconium ingot in melting cup; (15) Water inlet; (16) Water outlet; (17) Main power to melting cup; (18) Eyepiece; (19) Cart for removing melting cup. ASM drawing.

◆ Production of unalloyed zirconium from sponge by the double melting method will permit a recovery of 95 pct in the form of finished ingots free from flaws. . . . There are fewer failures in forging, due to segregation and internal flaws and no "head crop" is necessary. . . . Savings in metal are considerable when double melting is used.

◆ Many advantages are seen for the double melting technique. . . . There is no contamination of the crucible or electrode. . . . Good homogeneity is achieved. . . . Metal recovery is higher. . . . Forging losses are fewer . . . Power costs are low . . . Improved furnace design will permit better control of hydrogen to assure satisfactory mechanical properties.

◆ ONE of the main stumbling blocks to more rapid development of zirconium has been in devising a melting technique which would avoid contamination of the metal. Contamination arises from the extreme activity of the molten metal toward the common gases and all the normal crucible refractories. Gas contamination can be avoided by the use of argon, helium or a vacuum and a cooled copper crucible can replace the more conventional type when used in conjunction with an arc melting technique.

Arc melting in a cooled copper crucible is a revival of an old technique, which has been improved and applied to the melting of zirconium and titanium. Arc melting is quite different from normal melting where the whole charge is placed in a crucible and melted together. In arc melting only a small amount of metal is molten at any one time and the ingot is built up of metal which was first melted in the arc, remained for a short time as a molten mass and was then solidified by the cooling action of the crucible.

Unfortunately, this is not entirely satisfactory because the graphite or tungsten tips used on the copper electrodes to stop erosion cause considerable contamination of the metal. Although various modifications have been proposed to permit the use of graphite or tungsten tipped electrodes none of these are entirely satisfactory. The best way to avoid contamination from the electrode is to use a consumable electrode, i.e., to make the electrode from zirconium or titanium.

The possibility of using cooled zirconium tube electrodes was tried but despite ample supplies of coolant it was found impossible to prevent the metal melting rapidly in the high temperature of the arc and so it was decided to use consumable electrodes. The main development of this melting method as applied to zirconium occurred at the Bureau of Mines, Albany, Ore.

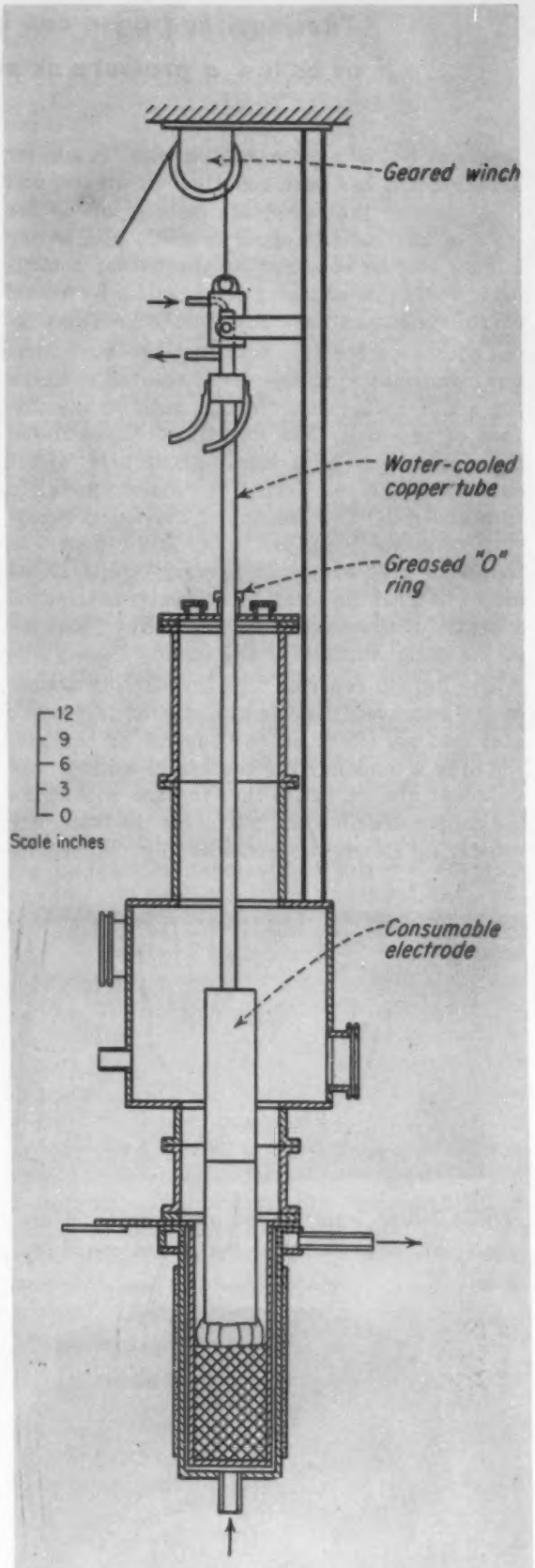
The electrodes, formed by pressing zirconium sponge at 50 tons psi to form a bar 2 x 2 x 20 in., are fed into the furnace and joined by arc welding by an operator using sealed-in rubber gloves. The melting was carried out in an atmosphere of inert gas consisting of 80 pct helium and 20 pct argon. This mixture permitted a higher voltage arc than pure argon and a steadier arc than pure helium.

### Ingot size increased

At first it was possible to melt 40 lb ingots in 50 min, half of the metal coming from the electrode and half from a feed of chopped sponge. The power was supplied from D. C. generators at 1800 amp with 20 v across the arc. Later, by using the method described for joining the electrodes it was possible to operate continuously and produce 8 in. diam 200 lb ingots with a power usage of only 0.5 kw per lb.

Although zirconium ingots could be produced without contamination and at a low power cost the results were not entirely satisfactory. There were several defects in the ingots such as: (1) lack of homogeneity due to failure of melting to off-set the variations in the sponge, (2) presence of hydrogen in finished ingot, (3) poor surface finish which reduced metal recovery, and (4) porosity in the ingot which persisted in rolled products. Until the first defect could be removed there was little use in thinking about the production of alloys. To reduce the effect of variation in the sponge it must be crushed and mixed but even then it is possible to produce an ingot which will show marked variations in hardness at various points.

The Bureau in later work[2] mentions the significant improvement obtained in overcoming the variations by the use of a direct-current magnetic field created above the melting area by covering the entire water-jacket, of the copper crucible, from top to bottom with three




INGOTS produced in primary melting are remelted in this arc-melting furnace.

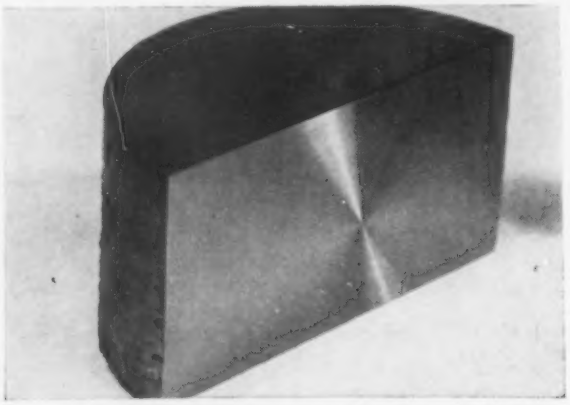
layers of No. 20 copper magnet wire. A similar arrangement has been reported[3] by others, and it is claimed that complete melting up to the wall of the cooled copper crucible and better mixing can be obtained by the use of a magnetic field induced inside the crucible by means of coils situated just outside the crucible.

The reason for this was that the horizontal flux components of the fields reacted to force the arc to rotate in a circular path on the surface of the melt. The Bureau of Mines found the application of a small amount of direct current to the coil caused the molten metal to spin and mix. The amount of current required was very small and as little as 0.2 amp was found to give sufficient stirring, while if 1.4 amp was used the rotation was such as to cause a centrifugal separation of the alloy particles in the outer surface of the ingot.

The Bureau reported that the stirring action, which improved the homogeneity of the ingot, also had an effect on the control of the arc. There is a tendency for the arc to wander and a danger always exists that the arc will strike the copper crucible and perforate the wall. The wandering effect was considerably reduced by the use of magnet wire coil which tended to stabilize the arc.

Another advantage gained by the use of the coil is the improvement in the surface finish of the ingot; the stirring action of the metal tends to prevent cold shuts.

ZIRCONIUM ingot melted under argon in atmospheric pressure. Note the porous condition.



REMELTED zirconium ingot under reduced pressure. The ingot shows good surface finish.

### Remelting in vacuum reduced porosity

Although the use of the coil was a considerable advance it did not give the perfect ingot; there was still heterogeneity, pores and dissolved hydrogen. Most of these troubles were overcome by remelting in a vacuum. The Bureau reports[2] the production of 6 in. ingots by the method and equipment which has already been described in an atmosphere of argon and helium and remelting the 6 in. ingots in a vacuum to form 8 in. ingots. The furnace used is shown on p. 117. The consumable electrode (1) is shown in the melting position attached to a water-cooled copper tube (2). The electrode arrangement can be raised or lowered by the geared winch (3), the copper tube passing through a greased 'O' ring (4). The remelting operation generally results in homogeneous ingots free from porosity but it is extremely difficult to remove all the hydrogen. However, the bulk of the gas is removed by operating with a mechanical vacuum pump maintaining a pressure about 4 cm. This pressure is low enough to permit the bulk of the gas to be removed while avoiding glow discharge.

### Dissolved hydrogen removed

The ingots produced by the remelting have a good surface finish and may be worked without machining. The product is satisfactory except for a small amount of hydrogen which remains dissolved in the metal. This gas may be removed by heating the ingot in a vacuum vessel and pumping until all gas is removed. This heat treatment is an undesirable operation, particularly as the heating may be prolonged. There is also the danger of any benefit obtained by hydrogen removal being counteracted by the absorption of small amounts of oxygen and nitrogen. Nevertheless, the presence of hydrogen in zirconium cannot be ignored as it is believed to have a pronounced embrittling effect even when present in amounts as low as 10 ppm.[4]

The major difficulty in removing the last traces of hydrogen from zirconium is the ease with which the metal absorbs hydrogen and while the melting is proceeding there is the probability that hydrogen lost from the molten metal is absorbed by the cooler metal below. The best means of keeping the residual hydrogen to a minimum is to operate at as low a

TABLE I

**POWER REQUIREMENTS FOR INGOT PRODUCTION**

| Ingot, in. diam | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|
| Power used, v | 25 | 28 | 30 | 38 | 40 | 40 | 40 | 40 | 40 | 40 |
| Amp | 800 | 1000 | 1800 | 2500 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 |

pressure as possible with a pump of a very large capacity.

The work reported at the Bureau of Mines[2] covered the production of double-melted ingots from 8 to 14 in. diam and presumably the same mechanical pump was used in all cases. This was a single stage pump with a free air rating of 110 fpm.

Although the Bureau's report mentions that the results of more extensive studies of arc melting conditions are to be published later they quote power input figures for production of ingots of various diameters, see Table I.

Energy input above this level is desirable only if maximum production is required and it is claimed that the use of 160 kw in the production of 5 in. ingots caused no difficulty. It would have been interesting to compare the residual hydrogen content of ingots produced by the low and high power inputs particularly if high pumping capacities had been available as it is believed to be possible to use lower working pressures and maintain good arc conditions if higher power inputs are employed.

The figure for the average power consumption for melting zirconium was about 0.25 kw-hr per lb based on the use of direct current with the electrode as cathode. From this figure it was calculated that the electrical efficiency of the furnace was about 50 pct.

Having produced homogeneous ingots of zirconium the Bureau proceeded to provide alloy ingots and showed that satisfactory homogeneity was obtained[2] even in the case of a tin alloy, one of the more difficult alloys to produce.

### Alloy addition controlled

Production of alloys involved the addition of the alloying elements, but the problem was quite unlike that encountered in ordinary melting where the whole charge, base metal and alloying elements are all molten at the same time. Progressive melting followed by rapid cooling is a characteristic of arc-melting and it is necessary that the alloying element or elements are added progressively and are controlled so that the molten pool at any one time contains the correct proportion of alloying ingredients.

Production of unalloyed zirconium ingots from sponge by the single melting method will give a recovery of 85 pct in the form of finished ingot free from flaws, according to the Bureau. If double melting is employed, however, the recovery of sound ingot is 95 pct. Further, there are far fewer failures in forging, due to segregation and internal flaws and no 'head crop' is necessary. Such savings in metal are enormous when compared to the additional power required for the second melting as the Bureau emphasizes by stating that the value of one pound of their metal is equivalent to the electrical energy required to melt four tons of ingot and although zirconium is a more expensive metal than titanium the same comparison applies to a lesser degree to this metal.

The advantage of the consumable electrode double melting technique compared to other methods of melting are: (1) no crucible or electrode contamination, (2) good homogeneity in ingots, (3) high metal recovery, (4) few forging losses and (5) low power costs. There is an inherent difficulty in removing the last small amounts of hydrogen. There can be little doubt, however, that modifications in design will result in, if not the complete elimination of hydrogen, at least sufficient removal to assure satisfactory mechanical properties. Also, such a method of melting while satisfactory for ingots would not on the present basis be suitable for making large castings.

It should be noted that the development of the arc melting technique has not been restricted to zirconium or the operations at the Bureau of Mines. The method has been applied to titanium by U. S. concerns engaged in the production of this metal. In particular, the Allegheny Ludlum Steel Corp. has developed the arc melting of zirconium and have melting capacity for 120,000 lb per year in the form of ingots of 1000 lb, while 2000 lb ingots are contemplated. The method has been applied to titanium to produce two-ton ingots free from carbon contamination, free from heterogeneity and with low hydrogen content.

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References

1. Zirconium & Zirconium Alloys, p. 125. American Society for Metals, Cleveland, Ohio.
2. "Production of Zirconium Alloys by Consumable Electrode Arc Melting." Beall, R. A., Borg, J. O., and Gilbert, J. L.
3. "An Arc Furnace for Melting Refractory Metals." Pugh, J. W., Hadley, R. L., and Herring, R. W. Metal Progress, 1953, 63, 3, 70.
4. "Effect of Hydrogen on the Embrittlement of Zirconium and Zirconium-Tin Alloys." Mudge, W. L., Jr. Zirconium & Zirconium Alloys, p. 146. American Society for Metals, Cleveland, Ohio.

*It's fully automatic—*

# Custom-Built Plating Machine Brings Plant to Peak Efficiency

**By J. J. Obrzut,** Metal Finishing Editor

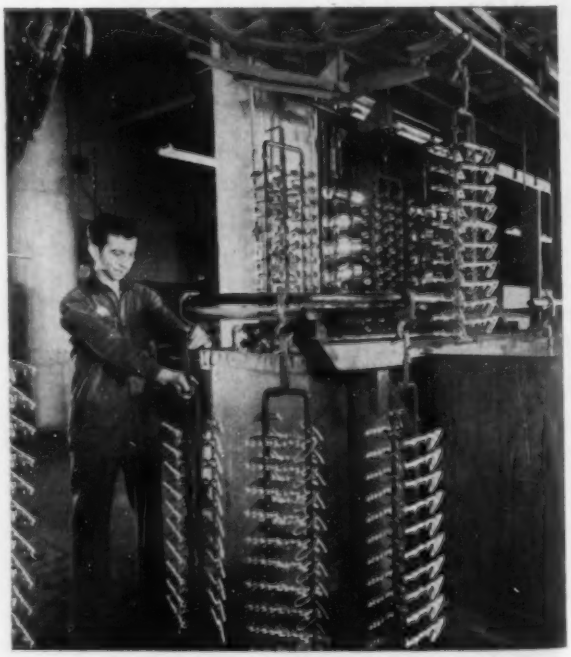
◆ A number of special engineering features built into a fully automatic plating setup have boosted production of automobile accessories and trim by a wide margin . . . The unit replaces two semi-automatic installations which required 14 operators . . . One man now loads and unloads the machine while another keeps constant check on the plating operation.

◆ The entire installation was designed and built by company personnel . . . Besides the higher production rate and greatly reduced amount of handling, savings result from using less brightener and from smaller drag-out losses . . . Most important is that plating quality is consistently uniform from lot to lot, and rejects have been cut to less than ½ pct.

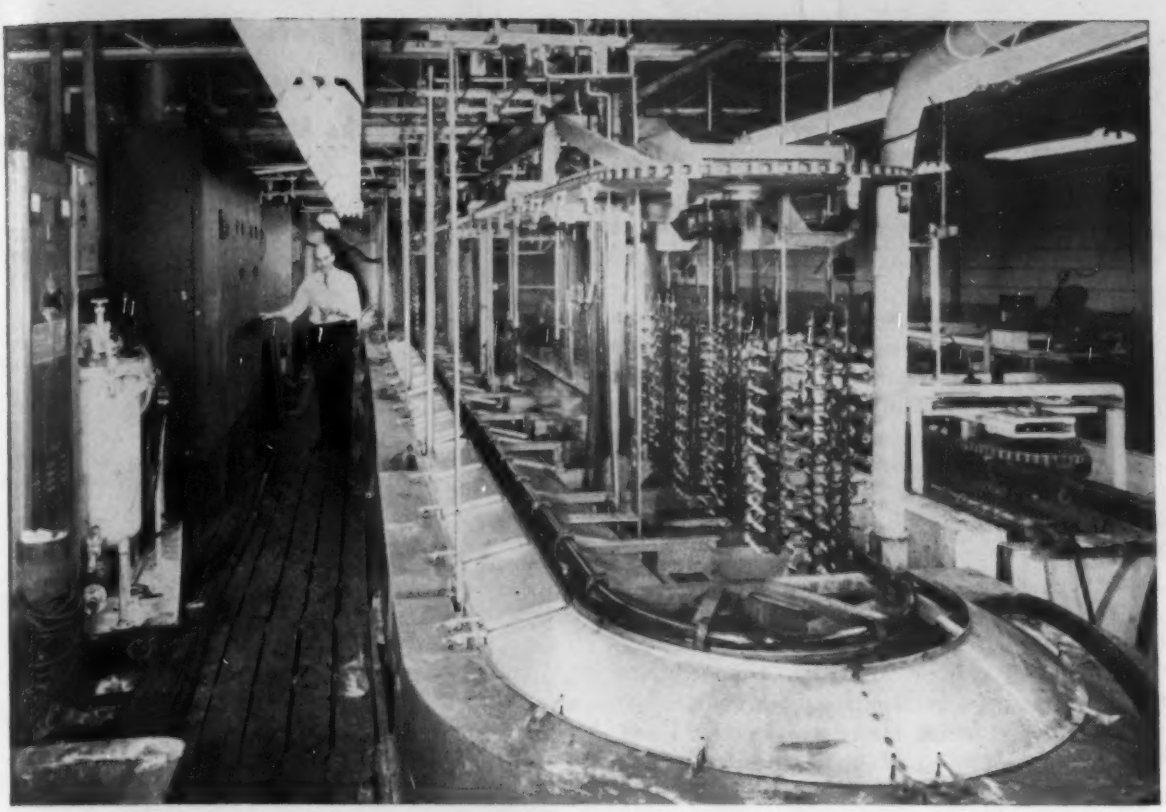
◆ INCREASED PRODUCTION demands, plus the desire to obtain more consistent and high quality deposits, has led the Ajax Mfg. Corp., Detroit, to convert from semi-automatic plating to a fully automatic setup. In planning the installation, many special engineering features were included in the design not only to cope with present needs, but to meet future demands as well.

The entire installation was approached with specific goals in mind—chiefly accurate control, simplicity, high output, minimum handling, flexibility and compactness. All of these requirements were met. As a result, production has been increased sharply, no handling is required except for loading and unloading, rejects have been cut to less than ½ pct, and consistently uniform deposit thicknesses are obtained.

Almost every piece of equipment in the setup was designed, fabricated and installed by Ajax personnel. In the few exceptional cases, equipment was either selected to meet exacting specifications or was custom built.



LOADING and unloading is now a one man job. Racks are moved in and out by chain conveyor.



**BUILT for compactness, the 80 by 6½-ft machine can handle up to 8000 parts per hour.**

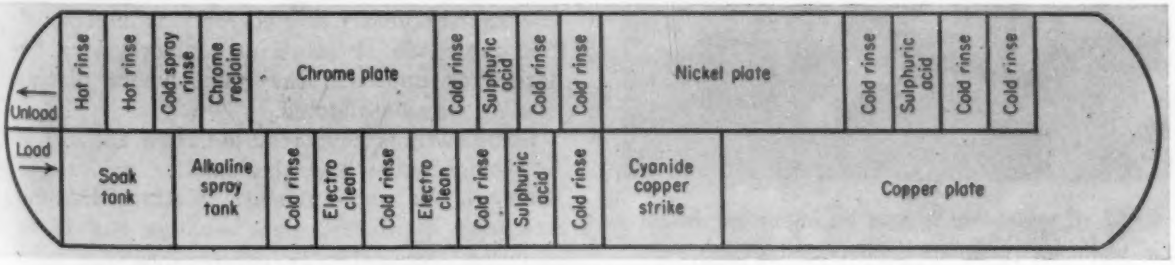
Previously, automobile accessories and trim which the company produces by the thousands of pieces were chromium plated in two semiautomatic setups. These required a great deal of manual handling, much of it unproductive effort. In addition to being time consuming and costly, drag-out was excessive, plating thicknesses varied from lot to lot, and rejects sometimes ran as high as 10 pct.

In an effort to offset some of the loss from rejects alone, parts were stored, then sorted with the thought of salvaging some. Parts that could be salvaged were put through the costly process of stripping and replating. Other parts were scraped.

Fourteen operators were required per shift to handle the two semiautomatic setups. Now, with the new installation, one man loads and unloads the conveyor while another keeps a constant check on plating performance. Moreover, the work load previously processed in 14 hours can now be done in six hours. Since the firm produces the parts which it plates, it was possible to transfer employees to other jobs where the production demands were increased by the higher plating capacity.

On the new return-type machine, parts travel a distance of 160 ft from the loading to the unloading stations. Its hydraulically-operated elevator mechanism has a total lift of 52 in. This allows an effective rack space of 40 in. Tank depth is 44 in. throughout. Tank lengths were designed in 18-in. increments to conform to the push bar spacing.

Timing of the plating cycle is variable within a wide range. The number of racks finished per hour may be as many as 180 or as few as 10. In terms of output, this is equivalent to a rate of 800 to 8000 parts per hour, depending on the plating thickness, size, shape and num-




**LAYOUT of the fully automatic plating machine shows cleaning and plating sequence.**

***Ventilating system provides complete circulation of air at all time . . . Corrosion problems are reduced through use of nickel plated fittings . . . frequent checks keep quality high . . .***

ber per rack. Transfer time can be fixed to any predetermined length between 10 and 60 seconds.

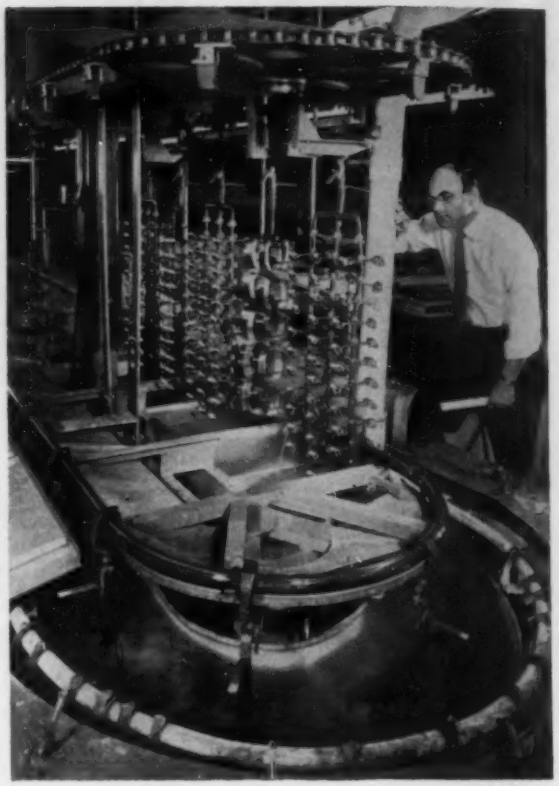
The forward travel mechanism consists of a motor drive and gear reduction unit. Power is transmitted to a horizontal chain through two sprocket wheels. A flipper on each tenth chain link provides the pushing action when the left mechanism is in the raised position.

The plating cycle includes a copper strike copper plate, nickel plate and chrome plate. Prior to the copper strike, parts pass through a complete series of cleaning and preparation solutions. Solutions in the plating tanks are filtered continuously through carbon packing. The solution turnover rate in the copper strike tank, for example, is four times per hour.

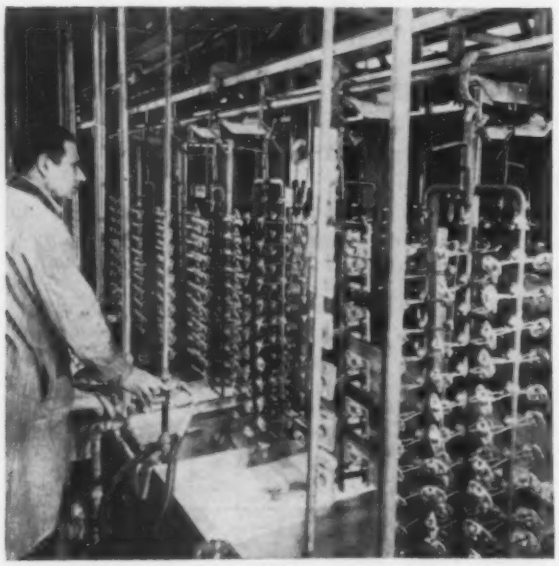
All acid and rinse tanks are rubber lined. The copper plating solution is air agitated and the tank is equipped with nylon diaphragms. Parts are agitated in the nickel solution, but this is done mechanically by means of the cathode rail moving at 22 ft per minute. Electric motorized valves, operating in the range of 85° to 220°F, maintain solution temperatures within ±1.5°F.

Plating power is supplied by custom-built rectifiers having capacities of 500 to 4500 amp and a regulation range of 0 to 12 v. Outdoor air blown through filters not only cools the rectifier stacks, but keeps them clean.

The ventilating system provides complete circulation of air at all times. Exhaust ducts of the down-draft type were installed in the floor. This system effectively removes fumes from the breathing zone and simplifies tank maintenance. Exhausted air is replaced by air drawn in to cool the rectifiers.



QUALITY checks are made regularly in the analytical lab. Solution compositions are never permitted to deteriorate to low efficiency.



EASE of maintenance was an important factor in planning. Ventilating ducts and piping were installed below the floor level.

Other features include nickel-plated fittings such as the push bars to reduce corrosion problems. Motors and switch boxes are moisture proof. Steam discharge and overflow piping connects directly to the sewage system.

The key to quality plating at Ajax is the analytical laboratory where around-the-clock checks are made on electrodeposits for thickness, porosity, and adhesion. Solutions are checked frequently, and corrections in composition are made, or solutions replaced, long before they approach the point where plating quality may be affected.

Some savings have resulted from the use of less brighteners and the smaller amount of drag-out. In semi-automatic plating, drag-out had been a problem since settings had to be changed frequently to compensate for tank losses.

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# New Technical Literature:

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***Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 129.***

## Motors

The 20 principal types of U. S. motors are discussed in this illustrated booklet. Shown are uniclosed, totally-enclosed, explosion-proof with and without fan, varidrive, syncrogear, combination variable speed and internally geared units, right-angle worm gear, verticlosed hollowshaft, vertical solid shaft, test stands and aircraft. *U. S. Electrical Motors Inc.*

**For free copy circle No. 1 on postcard, p. 129.**

## Expanding mandrel

New type "S" Super Count-Centric mandrel is described in this bulletin. The vital components of this precision tool are hand-lapped. This mandrel may be used for finish grinding, super-finishing, inspecting and other operations. The wide range of this tool is emphasized. *Le Count Tool Works, Inc.*

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## Radial drilling machines

Case histories of Cincinnati Bickford users are presented in this booklet. On-the-spot pictures show various tools in use. Featured are several Bickford tools, including multiple-disc clutch, spindle driving gears, positive tooth clutch, radial drill, compound tables, and gang drills. *The Cincinnati Bickford Tool Co.*

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## Live pilot bearing bushings

The uses and performance features of live pilot bearing bushings are discussed in this eight-page catalog. Illustrated are precision piloting applications of these bushings on boring mills, radial drill presses, and milling machines. Dimensional sketches and specification tables give additional information about these bushings. *J. G. Jergens Div. of Donley Products Inc.*

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## Grinding wheels

Grinding wheel selection is featured in this catalog. Points covered include abrasive types, bonding materials, wheel speeds, wheel markings, standard wheel shapes, mounted points, and abrasive polishing grain. Wheel specifications for common applications are given in tables, to serve as a guide to wheel selection. Catalog includes a supplement of net prices to the customer in various quantity lots. *Norton Co.*

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## Squaring shears

Series of four folders deal with Columbia steel squaring shears. The shears, having capacities from 3/16-¾ in., are pictured and described. Stressed are the speed, accuracy, economy, versatility, dependability, and safety of these shears. Tables, giving specifications, are included. *The Lodge & Shipley Co.*

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## Cerium

The uses and properties of cerium are summarized in this informative booklet. Among the uses mentioned are lighting aids, heating elements in electronics, and in metals. It is also used in magnesium alloys and aluminum alloys. A table of approximate dimensions and weights per unit is included. *British Flint and Cerium Manufacturers Ltd.*

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## Catalogs & Bulletins

### Wire stitching

The machine used in wire stitching corrugated and solid fibre boxes are discussed in this new catalog. The ability of wire stitching to make better boxes at lower cost is pointed out. The advantages of the wire stitching assembly and closure methods are discussed. Space is devoted to the Arcuate method of wire stitching. Complete specifications and dimensions are included. *Acme Steel Co.*

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### Automation

The combination of applied engineering, creative thinking, and electric motor drives to provide the "know-how" for automation of single machines or continuous processes is discussed in this 12-page booklet. *Reliance Electric & Engineering Co.*

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### Chemists' color control

The theory and use of a new additive-colorimeter designed to serve as a permanent "color memory" for control chemists is presented in this illustrated bulletin. Color control in the paint, food, textile, paper, plastics, linoleum, printing and ceramic industries is discussed. Although the subject is technical, the discussion is informal. *Fisher Scientific Co.*

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### Safety equipment

Safety and rescue equipment for use in emergencies are discussed in this new booklet. The booklet shows what items of equiment are needed by rescue teams in case of tornadoes, fires, explosions, or other types of emergencies. *Mine Safety Appliance Co.*

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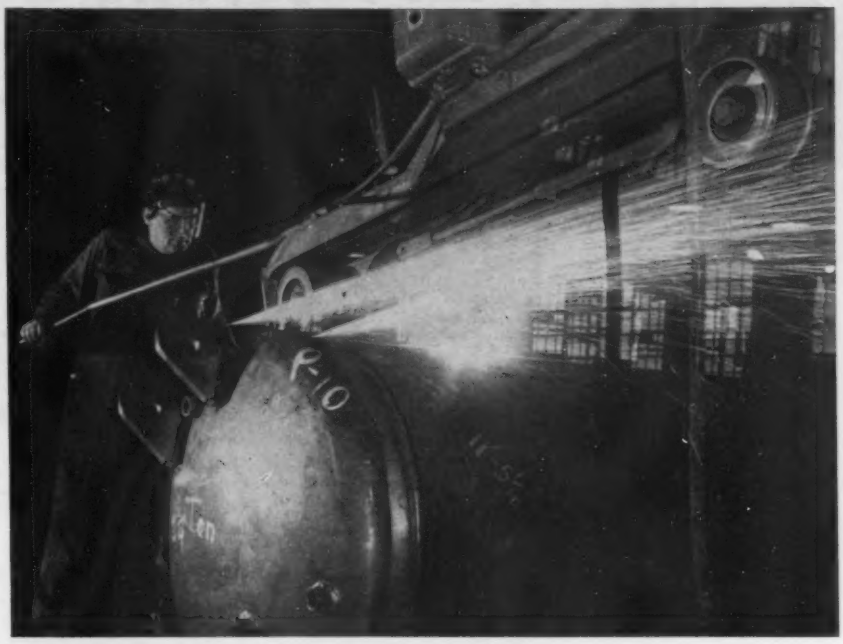
***Turn Page***


# How would you SOLVE IT?



**1 PRODUCTION PROBLEM:** To speed production and cut costs of removing extra-thick weld seams from 2¾ ton industrial boiler drums. Drums are made of 1" thick steel sections, welded together. Wickes Boiler Co. was using] grinding wheels—found them slow, unsatisfactory.

**2 SOLUTION:** A 3M Representative suggested that this Saginaw, Michigan, manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on a swing grinder. Manufacturer found that each 3M belt removed these extra-heavy-duty welds faster, better.

**3 RESULTS:** An immediate production increase with much higher quality finishes. (Note: manufacturer experimented with a "Brand X" belt, found it averaged only 9 feet of weld per belt . . . 3M belt removed 30 feet!) A 3M Representative can help you solve your grinding and finishing problems, too. Call him today. There's no cost or obligation.

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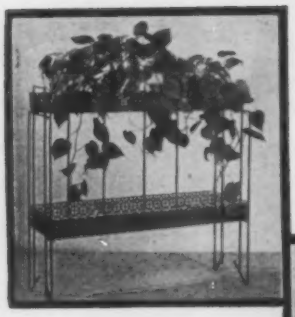
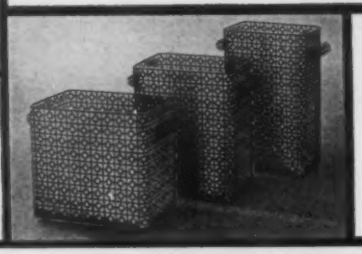


# Ideal design for the Ideal Mfg. Co.



*Distributed by Sun Glo Studios, New York, N. Y.*

With today's trend toward modern styling, Hendrick is becoming more and more important to fabricators of metal products. Typical of these is the Ideal Mfg. Co. of Oskaloosa, Iowa, who manufactures the attractive home furnishing items shown above using Hendrick's Perforated Metal Square Link design.

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## FREE TECHNICAL LITERATURE

### "Chipless machining"

The new Roto-Flo process, a "chipless machining" process for cold-forming splines, serrations, and similar forms, is presented in this illustrated bulletin. The concept behind this process and the machines that make it possible are treated in step-by-step fashion. Covered are the tooling, parts formed, automation of the cold-forming machines, a typical application, and design advantages possible through cold-forming by this new process. *Michigan Tool Co.*

**For free copy circle No. 12 on postcard, p. 129.**

### Comparison chart

This new and comprehensive comparison chart is on hard-facing rods and electrodes. The chart reviews the various rods and electrodes produced by 29 different manufacturers. Abrasion and impact qualities of each type rod as well as many of its applications are listed. The chart also lists individual hardness ratings, both as deposited and work-hardened, or heat-treated. *Mir-O-Col Alloy Company, Inc.*

**For free copy circle No. 13 on postcard, p. 129.**

### Blast cleaning equipment

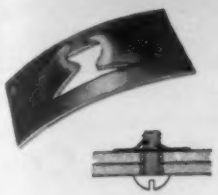
Information on the full line of Blastmaster equipment is provided in this new bulletin. The various features of the blast machines are illustrated, and the economy in using these machines for batch blast cleaning of castings, forgings and heat treated parts is emphasized. Dimensional plan views and elevations of the machines are given, as well as complete specifications. *Pangborn Corp.*

**For free copy circle No. 14 on postcard, p. 129.**

### Hydraulic pump

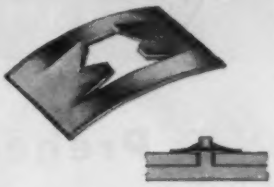
A new air driven hydraulic pump is described fully in this folder. Complete information on design, installation and operation is given. This pump is designed for small volume capacity at low and high pressures *The Aldrich Pump Co.*

**For free copy circle No. 15 on postcard, p. 129.**



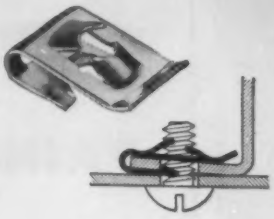
**FLAT TYPE**

One-piece self-locking spring steel fasteners. Replace threaded nuts, lock washers or spanner washers. Available in a wide variety of shapes and screw sizes.



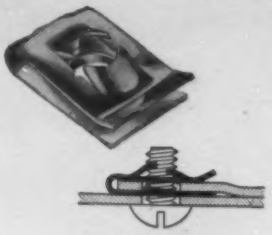
**PUSH-ON**

Zip over unthreaded die cast or plastic studs, rivets, nails, tubing, or wire to lock parts securely. Removable types available in many sizes.



**"J" TYPE**

Snap over edge of panels and into center hole locations. Hold themselves in place for blind assembly. Full range of panel thicknesses and screw sizes available.

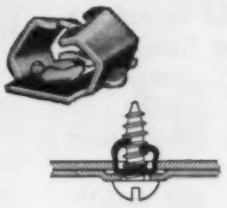


**"U" TYPE**

Perform same function as "J" type for reduced materials handling. Used where full bearing on lower leg of the SPEED NUT is required.

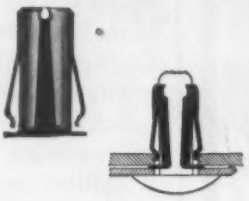
**LATCH TYPE**

Easily applied by hand, are self-retained in bolt-receiving position at center panel locations for blind attachments. Front mounting types are also available.



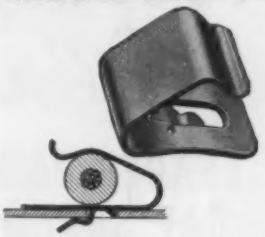
**EXPANSION TYPE**

For lightning-fast attachments in blind locations. Snap into mounting holes by hand. Screw spreads spring fingers, wedge-locks part in position. Secure, vibration-proof attachment.



**TUBULAR CLIPS**

For use with unthreaded studs or rivets. Virtually "nails" panels together where there is access to one side only. Permanent lock or removable types.

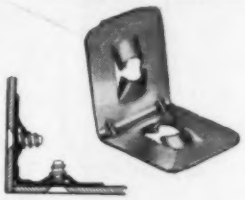


**CABLE, WIRE, AND TUBE RETAINERS**

Snap in place by hand, self-retained in position to receive wide range of cable, wire and tube sizes. Easily removed for service or re-location.

**HARNESS CLAMPS**

Open or close by hand — no tools needed. Attach to panel or pre-assemble to harness before installation. Cushioned to protect wires. Cannot open accidentally.

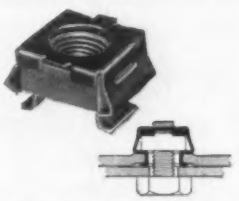


**ANGLE BRACKETS**

Combine bracket and fastener to reduce number of parts, speed up assembly and strengthen the structure. Variety of shapes and sizes.

**HOSE CLAMPS**

Self-locking, ratchet-type design, one-piece low profile construction — no bolts, nuts or thumb screws. Fast and easy to apply and remove for medium- and low-pressure connections.



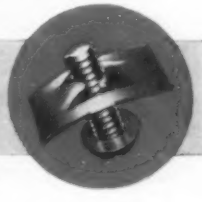
**NUT RETAINERS**

Retain square nuts in blind locations. No welding, clinching, staking — snap in by hand. Provided in a wide range of screw sizes. "U" and "J" type retainers available.

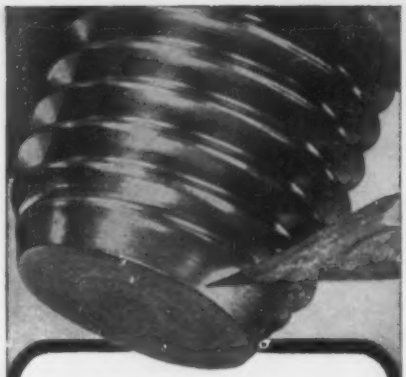
## Engineer Savings into your products with SPEED NUTS® — *The Fastest Thing in Fastenings!*®

Assembly cost savings from 30% to 75% . . . increased product quality . . . reduced materials handling . . . far less field service problems. These are a few of the reasons why more and more manufacturers are specifying SPEED NUT brand fasteners. Write today for your copy of "Savings Stories"—a book full of cost-saving fastening reports. TINNERMAN PRODUCTS, INC., Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine).

TINNERMAN *Speed Nuts*®



MORE THAN 8000 SHAPES AND SIZES



TOUGHER!

Allen

LEADER POINT CAP SCREWS

Dropping, knocking against metal surfaces and faulty line-up are major causes of damaged threads. Allen's new unthreaded leader point substantially reduces the causes of screw thread injury, or damage to threaded holes. Grip Heads, precision fit sockets that adhere to the key, *plus* the new leader points, make Allens the world's easiest starting cap screws, particularly in inaccessible spots. Sold *only* thru leading Industrial Distributors.

ALLEN

MANUFACTURING COMPANY

Hartford 2, Connecticut, U.S.A.



# PAINTING: Preheat Cuts Costs

**Electric heaters have cut barrel painting time from hours to minutes at this reconditioning plant . . . Less paint is needed . . . Paint adheres well without blistering.**

Painting time has been cut from 3 hours to 15 minutes and less paint is required to refinish barrels at the Barrel Remodeling Co., Kansas City, Mo., since a preheating system was installed.

Reclaimed barrels are placed on revolving rollers so that heat is applied uniformly and rapidly just before spray painting. Six Chromalox radiant units are arranged to form a compact open-end radiant tunnel. Far-infrared electric heaters of the high intensity all-metal type were used for this application.

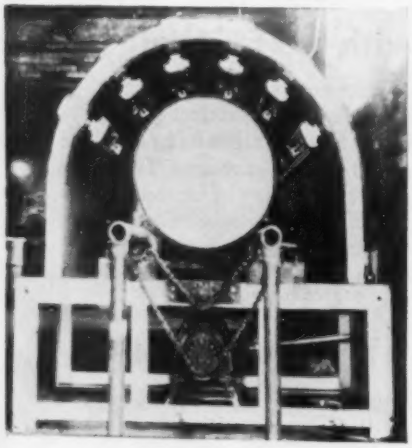
Only 30 seconds is required to preheat barrels to the required 175°F. This saves drying time and the drying step no longer limits the rate of production.

### Paint Won't Blister

After heating, the barrels are placed on end-spinners in the spray booth for an even coating of paint. Paint adheres well to the preheated surface, there is no blistering at 175°F and the paint dries fast and evenly.

A considerable amount of paint is saved by this heating arrangement. The heat appears to reduce the viscosity of the paint, permitting a given quantity to be applied evenly over a larger area and reducing the tendency of thicker coats to pile up or run at certain places.

Other advantages of using the all-metal radiant heaters for this application are found in their long life and indestructibility. Heaters of this type are not damaged by vibration of the machine or by occasional contact with the steel barrels.



*Turns while heating . . .*

**WANT MORE DATA?**

***You may secure additional information on any item briefed in this section by using the reply card on page 129. Just indicate the page on which it appears. Be sure to note exactly the information wanted.***

# H-Bomb:

**AISI book maps before-and-after raid planning.**

What to do in the event of an atomic or hydrogen bomb attack is the subject of a new manual published by American Iron and Steel Institute. Specifically, it outlines the best steps the steel industry can take in such an event but the principles are readily adaptable to other industries as well.

Titled "Industrial Defense Planning Manual—Iron and Steel," the book blueprints actions that should be taken both before and after an enemy attack. Major subdivisions cover administration, personnel, security, communications, training, medical and rehabilitation.

These are all detailed on both the company and plant levels.

Book's introduction points up management's responsibility "for the safeguarding of personnel and facilities at all times," and urges business leaders to begin planning immediately if they haven't already.

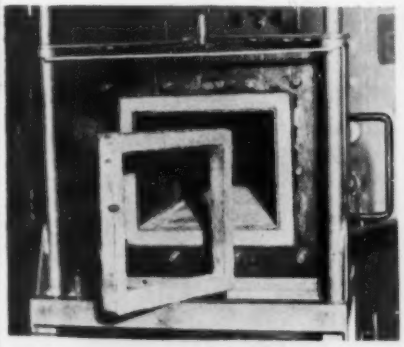
The publication is the result of a 5-month intensive study program.

## Retort Seal:

### Gas tight hydrogen retort seal made from aluminum bar.

Hydrogen leakage from annealing furnace retorts has been eliminated at the Indianapolis, Ind., Naval Ordnance plant with an improved retort seal made of aluminum bar and woven asbestos.

Four pieces of 1 in. aluminum bar are machined and welded to fit the seal flange on the retort. Pieces of woven asbestos are cemented to the face and back of the aluminum seal, in the seal flange, on the face of the retort and on the cover plate. This provides two layers of asbestos on each side of the seal. The seal is independent of the retort and cover plate and facilitates removal for loading and unloading the furnace.



*Asbestos lining used . . .*

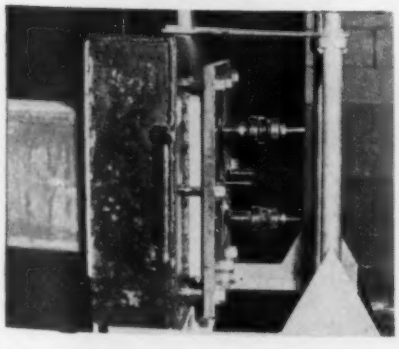
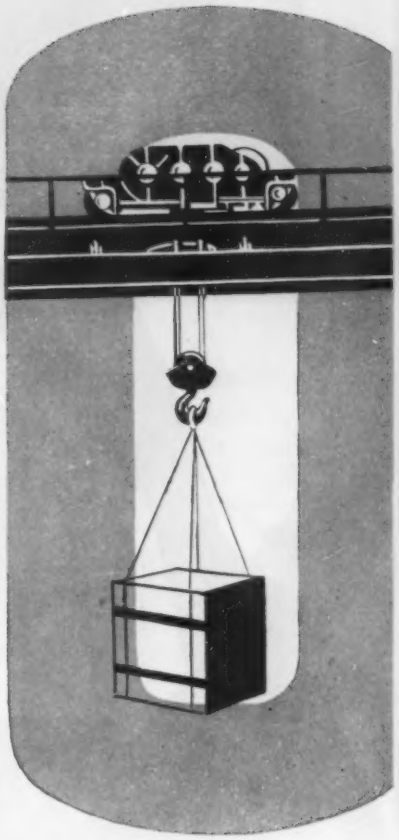
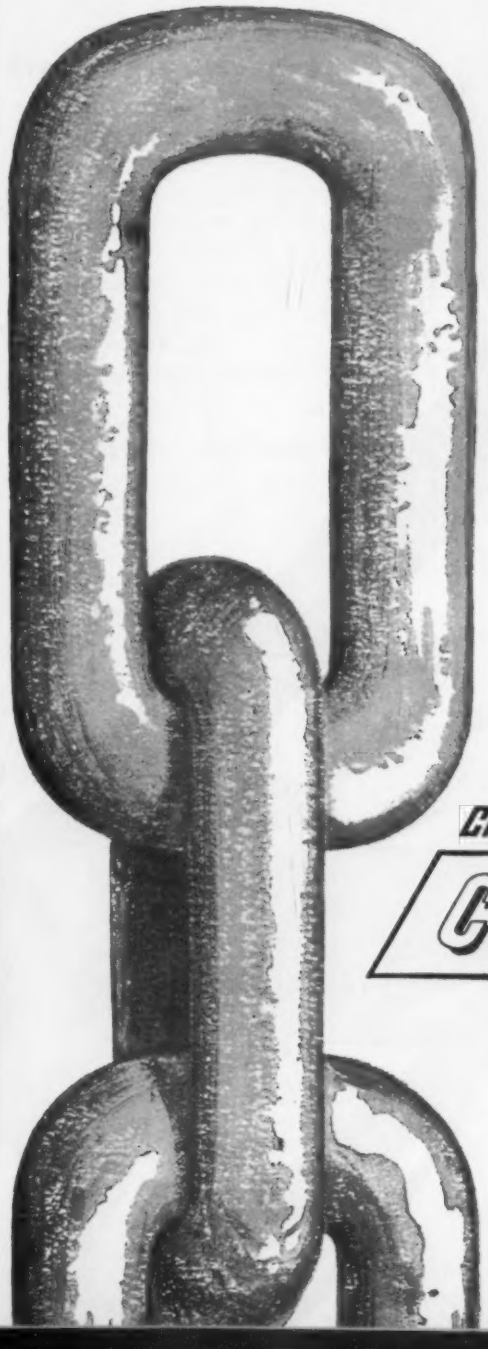


*Plate holds seal tight . . .*

important ⇨ LINK in AUTOMATION





**A step toward automation is equipment for faster, less costly handling of heavy materials; cranes, custom designed for specific applications. Conco engineers can design such cranes — the right lift, the right speed, the right clearances. Thirty seven years experience are behind every Conco Crane recommendation. Request a Conco representative to call and discuss your problem. Or, write for Bulletin 3000A covering the complete Conco Crane line.**

CRANES HOISTS

CONCO

**CONCO ENGINEERING WORKS**

Division of H. D. Conkey & Company

15 Grove St., Mendota, Illinois

AFFILIATES:

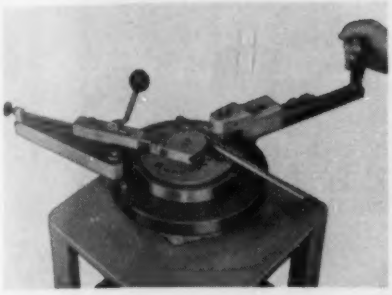
Conco Engineering Works - Domestic Heating Equipment

Conco Building Products, Inc., Brick, Tile, Stone

# NEW EQUIPMENT

**New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 129 or 130**

## Material clamping device for Di-Acro benders



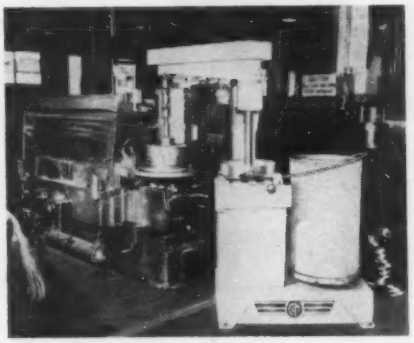
Designated Di - Acro Quik - Lok Clamp, a new accessory is said to be especially valuable when forming tubing, angle, channel and extrusions on the No. 1 and 1A models of the Di-Acro Bender because it locks the material securely in position and can be instantly released to remove the formed part. The clamp can be easily adjusted for any radius to 2 in. on the No. 1 model and 6 in. on the No. 1A model, and will handle stainless steel tubing up to ½ in. diam, round steel bar up to ⅝ in. One tube clamp block is supplied with each clamp. *O'Neil-Irwin Mfg. Co.*

**For more data circle No. 29 on postcard, p. 129.**

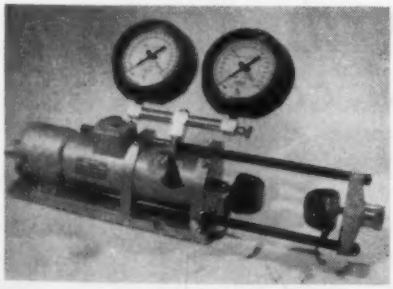
## Packaging and handling wire products is simplified

Machinery that incorporates the PAYOFFPAK principle simplifies many problems in the packaging and handling of wire and wire products. With the Model 126 attachment, 500 lb of wire can be run into a PAYOFFPAK, the cover attached and the drum shipped. This eliminates costly tying, wrapping and packaging operations. The wire processor removes the drum cover and inserts the starting end of the wire into his unit. The wire pays off free of tangle and variable drag, and a longer continuous run is realized. Model 126 operates synchronously with the unit to which it is attached. *Coulter & McKenzie Machine Co.*

**For more data circle No. 30 on postcard, p. 129.**



## Hydraulic tensile tester has accuracy of ±1 percent



Low cost hydraulic tensile testing machine meets Army, Navy, Federal and ASTM specifications for a guaranteed accuracy of ± 1 pct of indicated load. The unit, developed by Cal-Testing Machine Co., has dual capacity load ranges of 0-1000 lb and 0-5000 lb, weighs 70 lb and is about 36 in. long. Accessories adapt the machine to compression and flexure tests. Cal-Tester is used for spot weld certifications, rivet shear, terminal pull-off strengths, metal-to-metal adhesives. *Pacific Scientific Co.*

**For more data circle No. 31 on postcard, p. 129.**

## Metering loader rated at 100 to 5000 lb per hour

Miscellaneous small parts such as bolts, nuts, rivets, washers and stampings can be metered at the rate 100 to 5000 lb per hr, to any continuous appliance through the use of a variable speed drive having a 20 to 1 variation. The loader can be made to distribute the work evenly across the full width of the conveying mechanism in the appliance being fed. It will handle parts as small as 1/16 in. thickness or diameter. Standard hopper which empties itself, holds up to 1000 lb of average size bolts. A floor area 7¾ ft long x 4½ ft wide is required for the 18 in. wide belt which loads at a height of 33 in. and discharges at 7 ft. The metering loader can be built to meet special conditions. *Industrial Heating Equipment Co.*

**For more data circle No. 32 on postcard, p. 129.**

*Turn Page*

## At the '54 Metal Exposition—Nov. 1-5 . . .

# 50,000-PLUS METALS INDUSTRIES MEN

## *WILL LEARN NEW WAYS OF CUTTING COSTS!*

Your competitors . . . thousands of 'em . . . will be on hand at this great industrial event to check closely on everything that's new and improved . . . everything that will help them build better products . . . cheaper . . . faster!

They'll come from all corners of the land . . . these 50,000-plus metals industries men . . . and they'll take away with them, when this great Metal Show ends, more ideas . . . more information and more know-how than any 'stay-at-home' executive could possibly match!

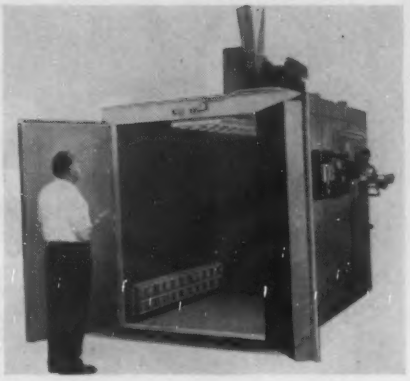
*Owned and Managed by*
AMERICAN SOCIETY FOR METALS
W. H. Eisenman, *Managing Director*
Chester L. Wells, *Ass't. Director*

**INTERNATIONAL AMPHITHEATRE**
CHICAGO NOV. 1-5

NATIONAL METAL EXPOSITION

NATIONAL METAL CONGRESS

## New batch type ovens adaptable for burn-off



A complete standard line of batch ovens, available with gas or electric heat source, are adaptable for burn-off, a modern method of metal preparation for painting and finishing, which eliminates degreasing and keeps metal from immediate rust formation. Other uses include baking new type finishes, preheating, drying, curing, dehydrating and all types of baking operations. Air circulation is automatic, both horizontal and vertical, completely surrounding the work to assure uniform temperature. Gas models have Eclipse gas burners with electric pushbutton ignition and safety pilot. Electric models have Inconel-sheathed life-time heating elements with outside terminals. *Grieve-Hendry Co., Inc.*

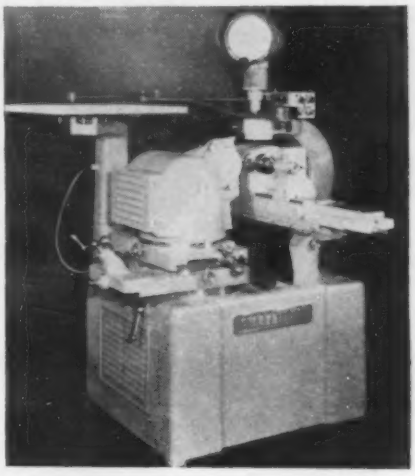
**For more data circle No. 33 on postcard, p. 129.**

## Single lever does three jobs on gas powered truck

Throttle, power lift and direction are controlled by a single lever on the Colson Handler, a gasoline powered, rider-type lift truck with hydraulic drive and hydraulic control. When lever is moved forward, or backward for reverse, a hydraulic pump, operating off engine, delivers oil from an oil reservoir to a fluid motor which is linked to the drive wheel by a gear reduction unit. When lever is lifted, oil is pumped to the platform's load lifting cylinder. The Handler automatically shifts from low to high and from high to low either forward or reverse. Cushioned brakes are automatically applied when lever is released. Weighing 1075 lb, the truck is powered by a 6 hp, single cylinder, four cycle engine. Maximum speed is 4 mph. *Colson Corp.*

**For more data circle No. 34 on postcard, p. 129.**

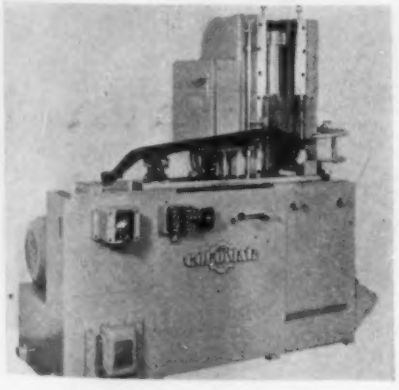
## Special machine designed for circular grinding



Model No. 123 Micro-Form Grinder will grind cylindrical work and circular form tools up to 8 in. diam x 8 in. long. It can be used to grind forming, beading and seaming rolls and is found satisfactory for grinding intricate and close tolerance profiles on Crushtrue grinding rolls. Finish grinding can be done directly from a drawing, requiring neither templates nor masters. The grinder is available with either a 30-power scope or 30-power combination screen and scope. It may be furnished with either live or dead center workheads. The pantograph has a ratio of 50:1, and the drawing table will accommodate a 20x20 in. drawing. Work up to 10 in. diam x 9 in. long can be swung between centers. Maximum size grinding wheel used is 7 in. Neither the spindle nor the workhead needs to be adjusted vertically as both are in a fixed plane. The wheelhead provides spindle speed of 3000 rpm. *Sheffield Corp.*

**For more data circle No. 35 on postcard, p. 129.**

## Kingpin holes broached at high rate of speed



Unified broachings has been put into effect with the combined fixture and machine design for broaching kingpin holes in the front axles for automobiles with a vertical pulldown machine. Key to high production speed and accuracy is the simple fixture that supports the I-beam during the broaching operations. Two simple fixture sections locate and support the axle. The fixture does not include a clamp: the smooth action of the broach being pulled through the part and the fixture section are sufficient to hold the axle in rigid and accurate contact with the fixture during the working stroke. The rough kingpin holes are 0.906 in. in diam. After broaching, the hole has a 0.922 in. diam and is 2.435 in. long. *Colonial Broach Co.*

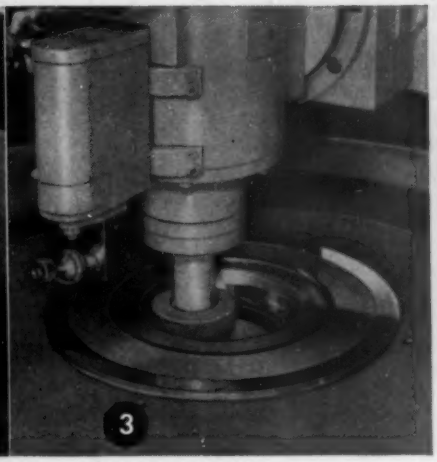
**For more data circle No. 36 on postcard, p. 129.**

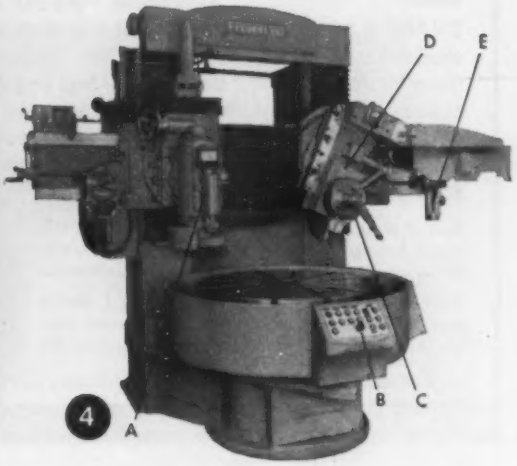
*Turn to Page 142*

One set-up...
1

# ...and you can turn, bore and finish grind a single workpiece to close tolerances on the NEW FRAUENTHAL SERIES 3100 TURNING AND GRINDING MACHINE.

## With it, you obtain unusual machining accuracies that assure concentricity of related surfaces.




WITH the new Frauenthal Series 3100 precision turning and grinding machine you get accuracies previously considered impractical.

Designed to meet the most exacting requirements of jet engine manufacture as well as other precision applications, the Series 3100 machine is new from the ground up. Its unique design presents a host of opportunities to put large and extremely close-tolerance jobs on a mass production basis. And the 3100 offers exceptional capacity for precision turning and precision grinding.

### Check these salient features

- Ultra-precision work table bearings
- Hydraulically actuated turning slide
- Hydraulically actuated grinding slide
- Super precision grinding spindle
- Conveniently located controls and safety switches

### . . . and this optional equipment

- Hydraulic tracer control
- Electronic table surface speed control
- Hydraulic wheel dressers for varied applications

## Frauenthal Division

**THE KAYDON ENGINEERING CORP.**
**MUSKEGON, MICHIGAN**

## ...about the pictures

**PHOTO 1** shows how the operator uses a Series 3100 machine to finish bore the inside diameters preparatory to grinding operations.

**PHOTO 2** shows the machine's contouring attachments being used to face the top surfaces of a workpiece.

**PHOTO 3** shows how the machine performs close-tolerance finish grinding of the workpiece's top surfaces and inside diameter, to assure concentricity and squareness of related surfaces.

**PHOTO 4** illustrates (a) grinding spindle with graduate swivel mounting, (b) push-button control panel, (c) five-station tool turret, (d) hydraulic actuated turning slide, (e) hydraulic tracer control (optional).

### May we help you?

If you'd like further information on how the Series 3100 precision turning and grinding machine can give you production and/or tool room advantages — our engineers are at your service. Write for informative bulletin No. 301.

"KRANE KAR SAVED US $3824.24 IN 8 MONTHS,"

Says V. James DeNaples,
TECHNICAL SERVICES FOREMAN,
NORMA-HOFFMANN
BEARINGS CORP.

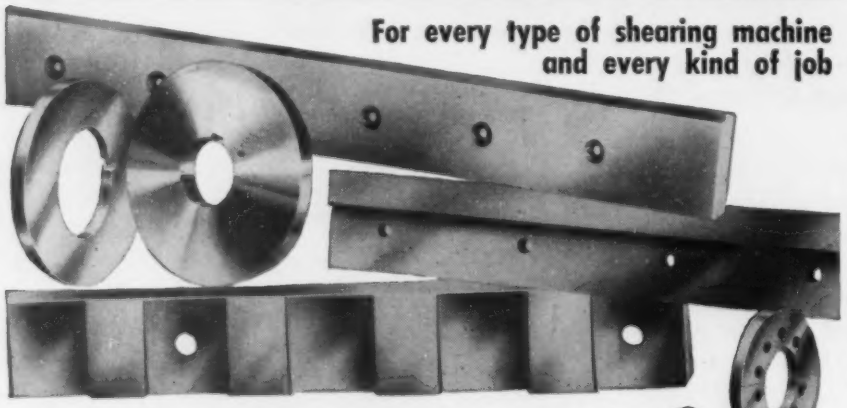
**"THIS VERSATILE YARD CRANE** simplifies our materials-handling," says Mr. DeNaples, "cuts operations and travel trips, saves us a considerable amount of work and time. Our ***KRANE KAR*** speeds unloading of incoming materials . . . transports and stacks them at storage . . . loads them on floor trucks for delivery inside *(long shafts of tubing, stacked bearing ring forgings, 800 and 1000 lb. coils of steel strip).* Also loads outgoing scrap and waste drums on trucks and gondolas; tows sludge wagon from grinding waste chute to waste dump, up-ends it, tows it back." Monthly net savings—$478.03! *Ask for Bulletin No. 89.*

Gas or diesel, 9 to 37 ft. booms or adjustable telescopic booms; pneumatic or solid rubber tires; electric magnet, clamshell bucket and other accessories.

*USERS: Carnegie-Illinois Steel, U.S. Steel, Bethlehem, Youngstown S. & T., Basic Magnesium, Lima Locomotive, General Motors, Pullman Standard, Etc.*

***KRANE KAR*** **Swing Boom Mobile Crane . . . 1½, 2½, 5 and 10 Ton Cap.**

**SILENT HOIST & CRANE CO.** 851 63rd ST., BROOKLYN 20, N.Y.



**For every type of shearing machine and every kind of job**

**"multicut"**
**SHEAR BLADES and ROTARY KNIVES**

℞ **Engineered to the job . . .** Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

**"MULTICUT", "TUFCUT", "HOT WORK"**

THE WAPAKONETA MACHINE CO.
WAPAKONETA, OHIO.

*Knives Engineered for the Job Since 1891*


### Multi-purpose holder

Multi-purpose work holder provides a basic tool for scores of holding applications. Standard interchangeable jaws and clamps for holding single or multiple pieces, hold odd and regular shapes. The basic tool is a heavy ribbed casting properly

normalized and precision ground having slots in the base for bolting to machine table. A through hole accommodates long work. A positive work stop bar is recessed into the base. Compensating clamps for multiple holding are positive, have no springs. Accuracy is guaranteed to tenths. *Lassy Tool Co.*

**For more data circle No. 37 on postcard, p. 129.**

### Non-magnetic indicator

An accurate universal test indicator, available in non-magnetic form can be used with magnetic chucks,

parallels, V blocks, uprights, or wherever a magnetic field is present. Two models are available: Model 1 graduated 0.001 in., with range of 0.030 in.; Model 2 graduated 0.0001 in. with range of 0.008 in. *Federal Products Corp.*

**For more data circle No. 38 on postcard, p. 129.**

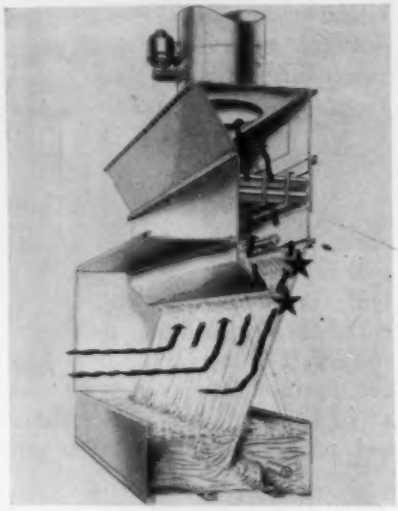
## Machine straightens and sorts bent core rod

Equipment is available which quickly and economically straightens the most badly bent core rod, sorts it according to length and delivers the rod to its proper size bin for easy, convenient use by the coremaker. Called the Rodmizer, this automatic machine eliminates replacement costs and enables practically all the rods to be used repeatedly. Bent rods are fed into a heavy-duty hammer type operating mechanism where rapid forge hammer action of 300 strokes per min, quickly straightens the rod. Straightened rod is ejected and carried by conveyor mechanism to the bin where it is stored for re-use. *Hydro-Blast Corp.*

For more data circle No. 39 on postcard, p. 129.

## Water-wash spray booth

Exhaust air receives a double scrubbing in this new water-wash spray booth. The booth incorporates the Binks clog-proof Dynaprecipitor manifold, and water circulating system. Style D has been designed for economical use in normal industrial production. The booth meets the requirements of fire, health and state authorities. *Binks Mfg. Co.*



For more data circle No. 40 on postcard, p. 129.

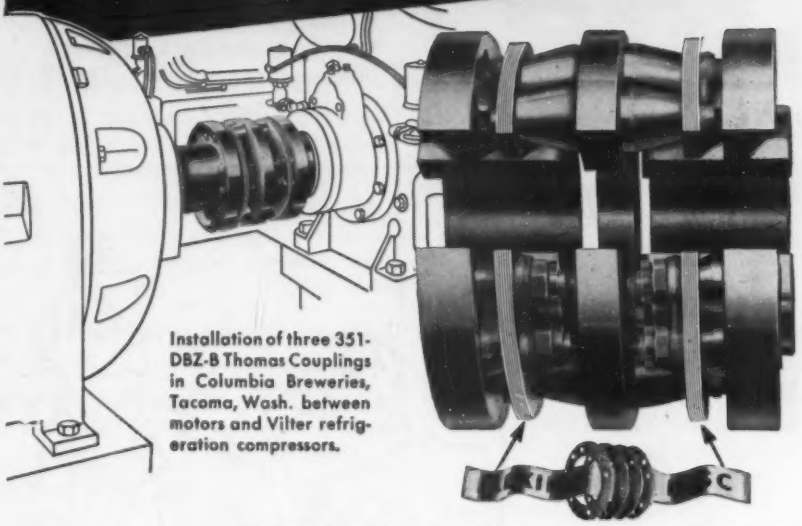
## Lamp parts

Heavy gage drawn brass lamp breaks, component parts for making lamp stylings, are available in a special high polished brass finish. By using different combinations of breaks a wide variety of lamp styles or designs can be created from a small number of components. Other standard finishes will eventually be stocked. *Plume & Atwood Mfg. Co.*

For more data circle No. 41 on postcard, p. 129.

*Turn Page*


**THOMAS FLEXIBLE COUPLINGS...**
**for more years of better service!**

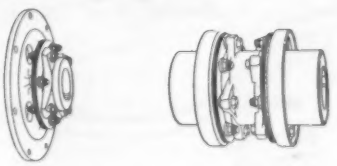


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

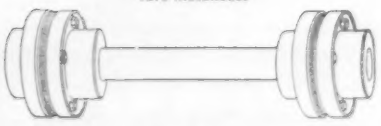
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

| FACTS | EXPLANATION |
|---|---|
| NO MAINTENANCE | Requires No Attention. Visual Inspection While Operating. |
| NO LUBRICATION | No Wearing Parts. Freedom from Shut-downs. |
| NO BACKLASH | No Loose Parts. All Parts Solidly Bolted. |
| CAN NOT "CREATE" THRUST | Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement. |
| PERMANENT TORSIONAL CHARACTERISTICS | Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained. |



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

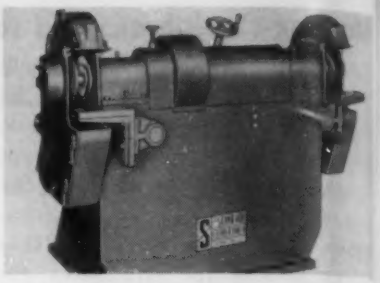
*Write for our new Engineering Catalog No. 51A*

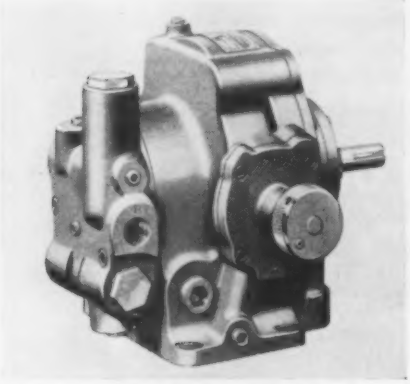
**THOMAS FLEXIBLE COUPLING COMPANY**
*Largest Exclusive Coupling Manufacturer in the World*
WARREN, PENNSYLVANIA, U.S.A.

## Constant cutting action increases production to 30 pct

The Type 10GVS double and infinitely variable speed snagging grinder is of rugged design and built according to the Safety Code of the American Standards and Foundrymen's Assns. Guards are structural plate steel with adjustment to compensate for wheel wear. The grinder accommodates two 20-in. diam x 3-in. face grinding wheels and the infinitely variable speed drive maintains a constant peripheral speed on the grinding wheel representing an economy to user. *Standard Electrical Tool Co.*

For more data circle No. 42 on postcard, p. 129.





## New pumps are complete package units

For variable speed straight line and rotary drive applications requiring 1 to 3 hp under precise speed or pressure control Oilgear has announced a complete new line of 1 and 2-way variable delivery pumps. Each pump is a complete package unit incorporating a variable delivery, high pressure, radial piston pump with balanced flat valve; a constant delivery, low pressure gear pump (small and large size); one of 8 standard controls; a 3-way suction and return valve for differential systems; dual disk type check valves for non-differential systems; a double acting high pressure relief valve and a gear pump relief valve. Pumps can be mounted on reservoirs integral with machines or furnished with oil reservoirs for mounting pump and motor. *Oilgear Co.*

For more data circle No. 43 on postcard, p. 129.

The parts are all made and on their way. Now I can go on my vacation thanks to you Pete and your favorite Columbia ATMODIE.

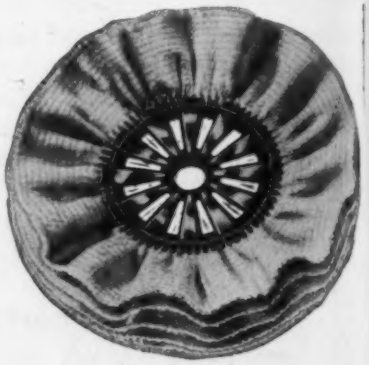
COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS


## Open bias sisal buf

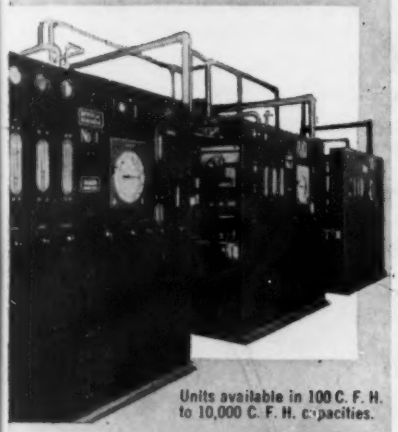
Extra-flexibility, long wear and cool running are qualities of a new buff. Combining the features of both bias sisal and bias cloth buffs, the result is an extra-loose buff for getting into crevices and contoured surfaces and for speeding production on both flat and curved surfaces. Because of open face construction, air is continually circulated through all parts, maintaining cool operations for long periods of time and eliminating heat discoloration problems. For maximum wear the open bias sisal buff is available with cloth covering or in 100 pct sisal models. *American Buff Co.*



For more data circle No. 44 on postcard, p. 129.

# heat treating of stainless steel

- Fully Automatic—no operating personnel required.
- High Purity—completely oxygen-free.
- Safe—NO explosion hazard.
- Economical—30% cheaper than dissociated ammonia.



Units available in 100 C. F. H. to 10,000 C. F. H. capacities.

## nitroneal gas generator

... produces pure nitrogen with a controllable hydrogen content that can be varied to meet changing requirements and maintained at any desired percentage between .25% and 25%. This flexibility permits the use of proper gas for any material or process at lowest cost.

Applications include bright annealing, heat treating and furnace brazing of stainless steel, low and high carbon steels and non-ferrous metals.

Write for free, informative booklet No. 21.

BAKER & COMPANY, INC. PRECIOUS METALS

113 ASTOR ST., NEWARK 5, N. J.

NEW YORK • SAN FRANCISCO
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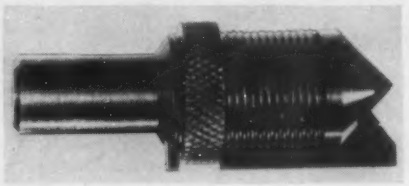
### All-in-one tool

A versatile machine shop handiman, the Multi-Tool, is offered as an all-in-one tool for chamfer, countersink, form and counterbore operations. Quick adjustment within each operation is immediately accomplished by release and reset of set screws and adjusting nut. Multi-Tool is designed for use in



solid stock machining or tube chamfering from ⅛ to ⅞ in. OD. It is ready for use in automatic screw and bench machine, drill press and turret lathe operations. Tool measures 1 in. diam x 2¾ in. long or ¾ in. diam x 2½ in. long. Cutter and shaper blades are available to specifications or blank blades for customer grinding to job requirements. *Johnal Co.*

For more data circle No. 45 on postcard, p. 129.

### Platform weigh scale

A platform scale utilizing strain gage load cells and pneumatic tare weight permits inexpensive and accurate net weight measurement. The electric weighing scale is adaptable for either batch weigh-

ing or continuous process control. Its high accuracy is said to be a result of a design of weighing structure using the techniques of flexural pivots to eliminate effects due to off-center loading. *Weighing Components, Inc.*

For more data circle No. 46 on postcard, p. 129.


# Large or small INDUSTRIAL CUT GEARS

- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality . . . same prompt service. Send us your requirements for quotation.

*ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.*

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WORMS • WORM GEARS
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SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.

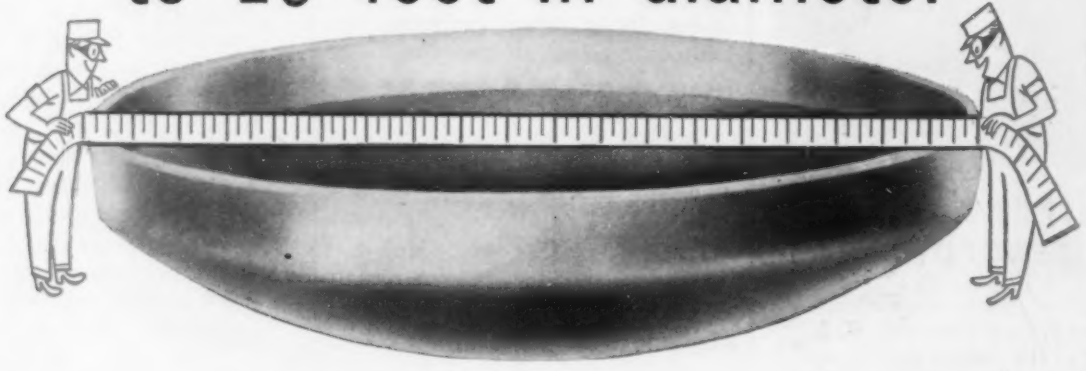
LIBERTY at 25TH PITTSBURGH 22, PA.

Quality Gears for over 60 years

# CLAYMONT FLANGED AND DISHED HEADS

## from 9 inches

## to 19 feet in diameter



Flanged and dished heads made by Claymont are available in sizes from as small as 9 inches to as large as 19 feet in overall diameter; and in gauges from 3/16-inch to 6 inches. They can be supplied in carbon steel, alloy steel or with stainless steel cladding.

All carbon and alloy steels are the product of our own open hearth furnaces—closely and completely controlled to meet customers' specifications.

We are also prepared to handle head-forming operations on both ferrous and non-ferrous metal supplied by the customer. To order, write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, 813 West Street, Wilmington 99, Delaware.

## *Claymont Steel Products*

***Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation***

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*Other Claymont Products . . .* Carbon and Alloy Steel Plates • Stainless-Clad Plates • Manhole Fittings and Covers • Large Diameter Welded Steel Pipe • Flame Cut Steel Plate Shapes

# The Iron Age SUMMARY . . .

**Mill production schedules aimed at holding last week's gains . . . More gains in production expected during next several weeks.**

**Production** . . . Steel mill production schedules this week are aimed at holding the substantial gains chalked up last week, and there are strong indications that still higher production rates will be achieved within the next several weeks. The ingot rate this week is estimated at 66.5 pct of rated capacity, while the ingot production index is estimated at 98.9 (1947-49 = 100).

Although improvement in steel business is so gradual it is scarcely noticeable from week to week the market is definitely stronger.

**Demand** . . . Galvanized sheets, oil country goods, structural shapes, and tinmill products are in best demand. Of these products, all but tinplate have shown recent signs of easing. Tinplate slumped earlier in the year but has recently come back strong following announcement of higher prices to be effective Oct. 1. Cold-rolled sheets, which had been quite easy, are firming noticeably. Hot-rolled sheets and strip are still soft, as are most types and sizes of bars. Sheets, especially, are expected to get an early boost from the automotive industry.

Shipment figures for the first 6 months show pipe and tubing accounted for 13.1 pct of all products shipped, compared to 12.1 pct in the similar period last year. Tinmill products accounted for 10.1 pct of total shipments this year, compared to only 7.1 pct last year. But bars and tool steel accounted for 14.1 pct of total shipments this year, compared to 17.3 pct last year. Although shipments of sheets and strip held a fairly constant per cent of total shipments, producers shipped a substantially larger share of cold-rolled sheets and galvanized sheets, while hot- and cold-rolled strip and hot-rolled sheets were smaller factors in the total.

**Distribution** . . . During the same period the biggest gain among steel users was by the construction industry which took 14.7 pct of total shipments, compared to 11.7 pct last year. Also showing improvement was the container industry with 11.1 pct of steel shipments this year, compared to 7.9 last year, and agriculture with 2.0 pct this year, compared to 1.7 pct last year. Automotive, rail and ordnance industries received smaller portions of total shipments.

**Prices** . . . Recent price reductions on several types of bars by a Detroit producer are being met by local and out-of-district producers. But lower prices apply only on a limited range of sizes.

## Steel Output, Operating Rates

| Production | This Week† | Last Week | Month Ago | Year Ago |
|---|---|---|---|---|
| (Net tons, 000 omitted) | 1,588 | 1,583 | 1,515 | 2,144 |
| **Ingot Index** (1947—49=100) | 98.9 | 98.5 | 94.3 | 133.5 |
| **Operating Rates** | | | | |
| Chicago | 68.5 | 69.0 | 69.0 | 99.5 |
| Pittsburgh | 66.0 | 67.0* | 64.0 | 100.0 |
| Philadelphia | 58.0 | 56.0 | 56.0 | 96.0 |
| Valley | 57.0 | 58.0* | 62.0 | 95.0 |
| West | 81.0 | 80.0* | 75.5 | 99.5 |
| Detroit | 84.0 | 77.0 | 74.0 | 99.0 |
| Buffalo | 60.5 | 56.5 | 56.5 | 91.0 |
| Cleveland | 75.0 | 73.0* | 54.0 | 94.0 |
| Birmingham | 75.0 | 75.0 | 65.0 | 96.5 |
| S. Ohio River | 79.0 | 76.0 | 70.0 | 80.0 |
| Wheeling | 93.0 | 95.0* | 77.0 | 101.0 |
| St. Louis | 69.0 | 66.5 | 46.5 | 89.0 |
| East | 51.0 | 49.0* | 48.0 | 86.5 |
| **Aggregate** | 66.5 | 66.5 | 63.0 | 94.0 |

* Revised. † Tentative

## Prices At A Glance

(cents per lb unless otherwise noted)

| | This Week | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| **Composite prices** | | | | |
| Finished Steel, base | 4.801 | 4.801 | 4.801 | 4.634 |
| Pig Iron (gross ton) | $56.59 | $56.59 | $56.59 | $56.59 |
| Scrap, No. 1 hvy (gross ton) | $30.17 | $29.00 | $28.67 | $35.33 |
| **Nonferrous** | | | | |
| Aluminum, ingot | 22.20 | 22.20 | 22.20 | 21.50 |
| Copper, electrolytic | 30.00 | 30.00 | 30.00 | 29.50 |
| Lead, St. Louis | 14.55 | 14.30 | 13.80 | 13.30 |
| Magnesium, ingot | 27.75 | 27.75 | 27.75 | 27.00 |
| Nickel, electrolytic | 63.08 | 63.08 | 63.08 | 63.08 |
| Tin, Straits, N. Y. | 93.87 | 93.75 | 93.125 | 82.50 |
| Zinc, E. St. Louis | 11.50 | 11.50 | 11.00 | 10.00 |

# Pickup On Minus Automakers

**Non-automotive customers responsible for mild upturn . . . Sheets have improved slightly . . . Oil country still firm but more competitive . . . Construction wire products are strong.**

◆ AN ENCOURAGING note in the recent steel market pickup, mild though it may be, is that it developed without any substantial assistance from the automobile industry.

Steel sales executives, while frank to admit uncertainty over whether a full-fledged turn for the better is in the works, almost unanimously cite the fact that the increase in steel orders is due largely to buying by non-automotive consumers.

If this situation continues until the automakers again enter the market in volume, producers look for a steady rise in production during the last quarter of 1954.

Product-wise, the market has changed but little. Sheets are in slightly better demand, particularly in the Chicago area, and at least one Pittsburgh producer says his order book has improved. Oil country goods, although more competitive, look firm for balance of the year. Galvanized sheets continue strong. Plates and structurals are fair but probably will sluff-off seasonally when building subsides. Merchant wire is entering a seasonal decline, and manufacturers wire and rods are just holding their own. Construction wire products are strong.

Bars generally are sluggish, waiting for a pickup in automotive demand. Tinplate is off and can makers' inventories are good. Alloy continues in a slump. Stainless has shown a slight pickup. The warehouse market is strongly competitive although slightly better than in August.

Foreign mills are intensifying the competitive picture in the U. S. Steel sales offices get the word that foreign producers are operating at high levels. Some of this material is being imported into this country at bargain rates. Oil country goods from Germany, Italy, and Belgium are being offered at $5 to $15 per ton below domestic product at New Orleans. Quality is good.

SHEETS AND STRIP . . . A mild pickup is the best that can be said. At **Chicago**, cold-rolled sheets are on 5-7 week delivery basis. Other producing points cannot say as much, although a **Pittsburgh** mill advises its order book on sheets has improved. Galvanized shows no sign of a letup. In **Chicago**, one producer can offer only January delivery on continuous. The tinplate market is dull, although **Chicago** reports bookings into October. Encouraging for the future is word that Westinghouse Electric Corp. is planning to spend over $3 million at Springfield, Mass., to produce window-type room air conditioners. Plant will have ultimate capacity of 300,000 units per year, with actual production expected to begin by mid-1955.

PLATES AND STRUCTURALS . . . Wide-flange beams continue to bear brunt of demand; standard structurals are only fair, and highly-competitive in some areas, particularly in the East. **Chicago** reports the product is on a two-week delivery basis, but no sign yet of the expected seasonal slump in demand. On the **West Coast**, construction projects hold promise for steady demand. But producer confidence in the future of the structurals market, notably in wide-flange beams, was brought home by U. S. Steel's announcement of plans to expand capacity for light wide-flange structurals sections at Homestead and at the South Works in Chicago. The Homestead project is expected to cost in the neighborhood of $10 million. Plate producers are still looking for that shot in the arm. Signs of activity for the freight car builders are encouraging for the near-future. Good news on the **West Coast:** Award of a Los Angeles area water pipeline project will mean orders for 11,933 tons of plate, 6450 tons of rods, 552 tons of hot-rolled sheets.

BARS . . . The market is still sweating it out. Producers are hopeful but not enthusiastic until they get some definite word from the automobile producers. Hot-rolled bars are slightly improved in **Chicago**, but there is no change in cold-finished or alloy. Warehouse inventories are heavy, particularly in cold-finished.

PIPE AND TUBING . . . U. S. Steel Corp. is considering construction of a multi-million dollar expanded steel pipe plant at its Columbia-Geneva Div. in Utah. Final decision will be made by the company's finance committee; option on property for the plant expires in December. Oil companies are ordering on a monthly rather than a quarterly basis, but oil country goods producers look for steady demand through the year. Mechanical and pressure tubing being sold on promptness of delivery. Merchant pipe also competitive on this basis, although construction has sustained demand to firm level.

WIRE . . . **Pittsburgh** producers say merchant wire has hit a seasonal decline, and manufacturers wire is little better; construction products are good; fine wire is in a depression since automotive buying for tire cord dropped off drastically. In **Chicago** mill volume is still good despite a slight drop in the past week. Merchant products in Chicago have picked up slightly.

WAREHOUSE . . . Demand is up slightly, but distributors are still talking about reducing mill orders through balance of year, even to January. Competition for business has reached the point in **Cleveland** where former paper-pushers are out beating the bushes for orders. Idea is that personal contact is one sure way to pick up business that otherwise might not materialize.

**Purchasing Agent's Checklist**

TITANIUM: Who's who in fast-growing industry . . . . . p. 65

STRAPPING: Usage grows, big year ahead . . . . . p. 67

FOUNDERS: Set up uniform industry standards . . . . . p. 75

DEFENSE: Plans for doubling present contracts in works p. 81

# Comparison of Prices

*(Effective Sept. 21, 1954)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | Sept. 21 1954 | Sept. 14 1954 | Aug. 24 1954 | Sept. 22 1953 |
|---|---|---|---|---|
| **Flat-Rolled Steel: (per pound)** | | | | |
| Hot-rolled sheets | 4.05¢ | 4.05¢' | 4.05¢ | 3.925¢ |
| Cold-rolled sheets | 4.95 | 4.95 | 4.95 | 4.775 |
| Galvanized sheets (10 ga.) | 5.45 | 5.45 | 5.45 | 5.275 |
| Hot-rolled strip | 4.05 | 4.05 | 4.05 | 3.925 |
| Cold-rolled strip | 5.82 | 5.82 | 5.82 | 5.575 |
| Plate | 4.237 | 4.237 | 4.237 | 4.10 |
| Plates wrought iron | 9.30 | 9.30 | 9.30 | 9.30 |
| Stainl's C-R strip (No. 302) | 41.50 | 41.50 | 41.50 | 41.50 |
| **Tin and Terneplate: (per base box)** | | | | |
| Tinplate (1.50 lb.) coke | $8.95 | $8.95 | $8.95 | $8.95 |
| Tinplate, electro (0.50 lb.) | 7.65 | 7.65 | 7.65 | 7.65 |
| Special coated mfg. ternes | 7.75 | 7.75 | 7.75 | 7.75 |
| **Bars and Shapes: (per pound)** | | | | |
| Merchant bars | 4.312¢ | 4.312¢ | 4.312¢ | 4.15¢ |
| Cold-finished bars | 5.40 | 5.40 | 5.40 | 5.20 |
| Alloy bars | 5.075 | 5.075 | 5.075 | 4.875 |
| Structural shapes | 4.25 | 4.25 | 4.25 | 4.10 |
| Stainless bars (No. 302) | 35.50 | 35.50 | 35.50 | 35.50 |
| Wrought iron bars | 10.40 | 10.40 | 10.40 | 10.40 |
| **Wire: (per pound)** | | | | |
| Bright wire | 5.75¢ | 5.75¢ | 5.75¢ | 5.525¢ |
| **Rails: (per 100 lb.)** | | | | |
| Heavy rails | $4.45 | $4.45 | $4.45 | $4.325 |
| Light rails | 5.35 | 5.35 | 5.35 | 5.20 |
| **Semifinished Steel: (per net ton)** | | | | |
| Rerolling billets | $64.00 | $64.00 | $64.00 | $62.00 |
| Slabs, rerolling | 64.00 | 64.00 | 64.00 | 62.00 |
| Forging billets | 78.00 | 78.00 | 78.00 | 75.50 |
| Alloy blooms, billets, slabs | 86.00 | 86.00 | 86.00 | 82.00 |
| **Wire Rod and Skelp: (per pound)** | | | | |
| Wire rods | 4.675¢ | 4.675¢ | 4.675¢ | 4.525¢ |
| Skelp | 3.90 | 3.90 | 3.90 | 3.75 |
| **Finished Steel Composite: (per pound)** | | | | |
| Base price | 4.801¢ | 4.801¢ | 4.801¢ | 4.634¢ |

| | Sept. 21 1954 | Sept. 14 1954 | Aug. 24 1954 | Sept. 22 1953 |
|---|---|---|---|---|
| **Pig Iron: (per gross ton)** | | | | |
| Foundry, del'd Phila. | $61.19 | $61.19 | $61.19 | $61.19 |
| Foundry, Valley | 56.50 | 56.50 | 56.50 | 56.50 |
| Foundry, Southern, Cin'ti | 60.43 | 60.43 | 60.43 | 60.43 |
| Foundry, Birmingham | 52.88 | 52.88 | 52.88 | 52.88 |
| Foundry, Chicago | 56.50 | 56.50 | 56.50 | 56.50 |
| Basic del'd Philadelphia | 60.27 | 60.27 | 60.27 | 60.27 |
| Basic, Valley furnace | 56.00 | 56.00 | 56.00 | 56.00 |
| Malleable, Chicago | 56.50 | 56.50 | 56.50 | 56.50 |
| Malleable, Valley | 56.50 | 56.50 | 56.50 | 56.50 |
| Ferromanganese‡, cents per lb. | 9.50¢ | 9.50¢ | 10.00¢ | 10.00¢ |
| ‡ 74-76 pct Mn base. | | | | |
| **Pig Iron Composite: (per gross ton)** | | | | |
| Pig iron | $56.59 | $56.59 | $56.59 | $56.59 |
| **Scrap: (per gross ton)** | | | | |
| No. 1 steel, Pittsburgh | $31.50 | $30.50 | $29.50 | $37.50 |
| No. 1 steel, Phila. area | 28.50 | 28.50 | 27.00 | 34.00 |
| No. 1 steel, Chicago | 30.50 | 29.50 | 29.50 | 34.50 |
| No. 1 bundles, Detroit | 25.00 | 24.50 | 23.50 | 32.50 |
| Low phos., Youngstown | 32.50 | 32.50 | 31.00 | 41.50 |
| No. 1 mach'y cast, Pittsburgh | 42.50 | 42.50 | 42.50 | 46.50 |
| No. 1 mach'y cast, Philadel'a. | 41.00 | 40.50 | 40.50 | 41.00 |
| No. 1 mach'y cast, Chicago | 42.50 | 40.50 | 39.50 | 37.50 |
| **Steel Scrap Composite: (per gross ton)** | | | | |
| No. 1 heavy melting scrap | $30.17 | $29.50 | $28.67 | $35.33 |
| **Coke, Connellsville: (per net ton at oven)** | | | | |
| Furnace coke, prompt | $14.38 | $14.38 | $14.38 | $14.75 |
| Foundry coke, prompt | 16.75 | 16.75 | 16.75 | 16.75 |
| **Nonferrous Metals: (cents per pound to large buyers)** | | | | |
| Copper, electrolytic, Conn. | 30.00 | 30.00 | 30.00 | 29.50‡ |
| Copper, Lake, Conn. | 30.00 | 30.00 | 30.00 | 30.125 |
| Tin, Straits, New York | 93.875† | 93.75* | 93.125 | 82.50 |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.00 | 10.00 |
| Lead, St. Louis | 14.55 | 14.30 | 13.80 | 13.30 |
| Aluminum, virgin ingot | 22.20 | 22.20 | 22.20 | 21.50 |
| Nickel, electrolytic | 63.08 | 63.08 | 63.08 | 63.08 |
| Magnesium, ingot | 27.75 | 27.75 | 27.75 | 27.00 |
| Antimony, Laredo, Tex. | 28.50 | 28.50 | 28.50 | 34.50 |

† Tentative. ‡ Average. * Revised.

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

**Steel Scrap Composite**

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 159→

| Producing Point | Basic | Fdry. | Mall | Bess. | Low Phos. |
|---|---|---|---|---|---|
| Bethlehem *B3* | 58.00 | 58.50 | 59.00 | 59.50 | ..... |
| Birmingham *R3* | 52.38 | 52.88 | ..... | ..... | ..... |
| Birmingham *W9* | 52.38 | 52.88 | ..... | ..... | ..... |
| Birmingham *U4* | 52.38 | 52.88 | 56.50 | ..... | ..... |
| Buffalo *R3* | 56.00 | 56.50 | 57.00 | ..... | ..... |
| Buffalo *I11* | 56.00 | 56.50 | 57.00 | ..... | ..... |
| Buffalo *W6* | 56.00 | 56.50 | 57.00 | ..... | ..... |
| Chicago *I4* | 56.00 | 56.50 | 56.50 | 57.00 | ..... |
| Cleveland *A5* | 56.00 | 56.50 | 56.50 | 57.00 | 61.00 |
| Cleveland *R3* | 56.00 | 56.50 | 56.50 | ..... | ..... |
| Daingerfield *L3* | 52.50 | 52.50 | 52.50 | ..... | ..... |
| Duluth *I4* | 56.00 | 56.50 | 56.50 | 57.00 | ..... |
| Erie *I4* | 56.00 | 56.50 | 56.50 | 57.00 | ..... |
| Everett *M6* | ..... | 61.00 | 61.50 | ..... | ..... |
| Fontana *K1* | 62.00 | 62.50 | ..... | ..... | ..... |
| Geneva, Utah *C7* | 56.00 | 56.50 | ..... | ..... | ..... |
| Granite City *G2* | 57.90 | 58.40 | 58.90 | ..... | ..... |
| Hubbard *Y1* | ..... | ..... | 56.50 | ..... | ..... |
| Minnequa *C6* | 58.00 | 59.00 | 59.00 | ..... | ..... |
| Monessen *P6* | 56.00 | ..... | ..... | ..... | ..... |
| Neville Isl. *P4* | 56.00 | 56.50 | 56.50 | ..... | ..... |
| Pittsburgh *U1* | 56.00 | ..... | ..... | 57.00 | ..... |
| Sharpsville *S3* | 56.00 | 56.50 | 56.50 | 57.00 | ..... |
| So. Chicago *R3* | 56.00 | ..... | 56.50 | ..... | ..... |
| Steelton *B3* | 58.00 | 58.50 | 59.00 | 59.50 | 64.00 |
| Swedeland *A2* | 58.00 | 58.50 | 59.00 | 59.50 | ..... |
| Toledo *I4* | 56.00 | 56.50 | 56.50 | 57.00 | ..... |
| Troy, N. Y. *R3* | 58.00 | 58.50 | 59.00 | 59.50 | 64.00 |
| Youngstown *Y1* | ..... | ..... | 56.50 | 57.00 | ..... |
| N. Tonawanda *T1* | ..... | 56.50 | 57.00 | ..... | ..... |

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1*, *G1* $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill

| Product | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, rerolling | 16.25 | 17.25 | 18.75 | 18.25 | 28.00 | 22.75 | 24.50 | 14.00 | ..... | 14.25 |
| Slabs, billets, rerolling | 20.50 | 22.75 | 24.75 | 23.75 | 36.25 | 29.50 | 32.25 | 18.25 | ..... | 18.50 |
| Forg. discs, die blocks, rings | 38.50 | 38.50 | 41.50 | 40.50 | 60.00 | 45.50 | 50.75 | 31.00 | 31.75 | 31.75 |
| Billets, forging | 29.50 | 29.75 | 32.25 | 31.00 | 46.50 | 35.25 | 39.50 | 24.00 | 24.50 | 24.50 |
| Bars, wires, structurals | 35.25 | 35.50 | 38.25 | 37.25 | 55.50 | 42.00 | 46.75 | 28.75 | 29.25 | 29.25 |
| Plates | 37.25 | 37.50 | 39.75 | 39.75 | 58.75 | 45.75 | 51.25 | 30.00 | 30.50 | 30.50 |
| Sheets | 41.25 | 41.50 | 48.75 | 43.75 | 62.75 | 50.50 | 59.25 | 34.25 | 41.25 | 34.75 |
| Strip, hot-rolled | 29.75 | 32.00 | 36.75 | 34.25 | 53.25 | 41.00 | 46.50 | 26.25 | ..... | 27.00 |
| Strip, cold-rolled | 38.25 | 41.50 | 45.50 | 43.75 | 62.75–63.00 | 50.50–50.75 | 59.25 | 34.25 | 41.25 | 34.75 |

STAINLESS STEEL PRODUCING POINTS:

*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4.*

*Strip:* Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6.*

*Bar:* Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5;* Ft. Wayne, *I4.*

*Wire:* Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

*Structurals:* Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11*

*Plates:* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, nd., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15.*

*Forged discs, die blocks, rings:* Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa *J2.*

*Forging billets:* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

# Labor Holds Copper Spotlight

**U. S. situation changes little . . . Kennecott to go on 4-day week if smelter, refinery don't reopen . . . Chile takes drastic steps to end mine strikes—By *R. L. Hatschek.***

◆ LABOR situation in copper continued to hold the center of the nonferrous stage early this week as strikes continued with little change in domestic properties. American Smelting & Refining Co.'s smelter and Kennecott Copper Corp.'s refinery were still out of action at Garfield, Utah, as this issue went to press.

Kennecott told workers last week that if these two facilities were not reopened the firm would have to go to a 4-day week at other properties. This would take effect Sept. 27 and would lay off about 500 and affect another 5000 workers.

Meanwhile, the Chilean government took strong measures in an attempt to end the strike at Anaconda Copper Mining Co. and Kennecott mines. Estimates place the Chilean government's loss due to the strike at about $4 million. The government ordered conscription of strikers and compulsory arbitration. They started back Monday.

COPPER . . . Labor situation being what it is, nobody is surprised that August copper production figures show a dip from the previous month. Copper Institute's domestic figures are: Primary crude production, 52,414 tons (July, 66,070); refined production, 103,901 tons (July, 107,095); deliveries to fabricators, 92,475 tons (July, 97,436); and refined stocks, 58,387 tons (July, 68,921).

Outside the U. S. the picture is largely the same except that stocks edged up slightly. The statistics: Primary crude production, 123,531 tons (July 130,518); refined production, 101,037 tons (July, 105,827); deliveries to fabricators, 104,005 tons (July, 105,281); and refined stocks, 172,326 tons (July, 170,558).

Each new day of continued idleness at struck copper facilities shortens the supply further and in some quarters it's expected that the market will remain in a tight position throughout the rest of the year. Meanwhile, London spot price climbed over 31.5¢ per lb late last week.

ALUMINUM . . . August production of primary aluminum in the U. S. totaled 125,296 tons—noteworthy primarily because it isn't a new output record. July retains that distinction for the moment at least with a total of 126,162 tons. But when the tallies are all in, third quarter 1954 will have established a new high for the 3-month period.

Total for the year through August now stands at 966,857 tons, about 5½ weeks ahead of the 1953 production rate. What happens through the remaining months of 1954 depends largely on the weatherman—specifically, on how much rain falls in the Pacific Northwest and in the Southeast.

The hugely expanded industry now reconciles itself to some loss of production in the latter part of every year due to low water behind hydroelectric plants. This is already being felt in the Southeast where production has already been trimmed slightly as a result of an unusually dry summer. It's believed that high-cost power is available but the producer does not wish to boost production costs while the aluminum market is still slack.

Outlook in the Northwest is reported good with respect to hydroelectricity—they managed to save some of the flood waters.

TIN . . . Malayan Tin Bureau has leveled a blast at "proponents of the scare and scarcity" who regard Communist gains in Indo-China as a serious threat to tin supplies. The Bureau states that the Southeast Asia tin supply is safe as long as the U. S. wants it. Counter argument is:

"Although Indo-China, adjacent to Red China, is obviously the most vulnerable Southeast Asian country, it has taken the Communists nearly 8 years to gain control of only 30 pct of the area and less than 45 pct of the population.

"Indo-China is not an important producer of tin. Its 1943-53 output of tin in concentrates averaged only 157 long tons a year.

"Malaya, Indonesia and Thailand are the largest tin-producing countries in Southeast Asia. Thailand adjoins Indo-China, but Malaya and Indonesia are more remote.

"Malaya is winning its war against the Communist-led terrorists, whose efforts since 1948 to interfere with tin production have been frustrated. Malaya's success in this respect is a far more potent factor in preserving Southeast Asia's tin supply for the U. S. than is the recent reverse in Indo-China in endangering that supply."

LEAD . . . As with the preceding increase, rising London lead quotations pulled up the U. S. price last week. The boost brought common grade lead to 14.55¢ per lb at St. Louis, 14.75¢ at New York. Following this, demand was fairly brisk with some buying by battery makers. This buying by battery manufacturers, it's felt in trade circles, will increase next month.

ZINC . . . Sales of slab zinc tapered off somewhat in the latter part of last week after a reasonably good tonnage had been sold earlier in the week. Buyers, it's noted, show a strong preference for flat prices rather than monthly averages.

While the London market ended the week about ½¢ per lb lower than the equivalent New York price, government stockpiling activity has firmly established the current 11.50¢ per lb East St. Louis quotation as a floor. Only way the market can go is up.

## Daily Nonferrous Metal Prices

*(Cents per lb except as noted)*

| | Sept. 15 | Sept. 16 | Sept. 17 | Sept. 18 | Sept. 20 | Sept. 21 |
|---|---|---|---|---|---|---|
| Copper, electro, Conn. | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| Copper, Lake, delivered | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| Tin, Straits, New York | 93.50 | 93.875 | 94.125 | .... | 93.875 | 93.875* |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.50 | 11.50 | 11.50 | 11.50 |
| Lead, St. Louis | 14.55 | 14.55 | 14.55 | 14.55 | 14.55 | 14.55 |

*Note: Quotations are going prices* **Tentative*

# Nonferrous Prices

*(Effective Sept. 21, 1954)*

## MILL PRODUCTS

*(Cents per lb, unless otherwise noted)*

### Aluminum

*(Base 20,000 lb. f.o.b. ship. pt., frt. allowed)*

**Flat Sheet:** 0.136-0.249 in., 2S, 3S, 34.9¢; 4S, 37.1¢; 52S, 39.2¢; 24S-O, 24S-OAL, 38.3¢; 75 S-O, 75S-OAL, 45.8¢; 0.081 in., 2S, 3S, 36.1¢; 4S, 38.8¢; 52S, 40.9¢; 24S-O, 24S-OAL, 39.8¢; 75S-O, 75S-OAL, 48.1¢; 0.032 in., 2S, 3S, 38.1¢; 4S, 43.0¢; 52S, 45.7¢; 24S-O, 24S-OAL, 48.4¢; 75S-O, 75S-OAL, 59.8¢.

**Plate, ¼-in. and heavier:** 2S-F, 3S-F, 33.6¢; 4S-F, 35.7¢; 52S-F, 37.4¢; 61S-O, 36.8¢; 24S-O, 24S-OAL, 38.4¢; 75S, 75S-OAL, 45.8¢.

**Extruded Solid Shapes:** Shape factors 1 to 5, 37.7¢ to 85.7¢; 12 to 14, 38.4¢ to $1.03; 24 to 26, 41.2¢ to $1.34; 36 to 38, 48.8¢ to $1.96.

**Rod, Round:** Rolled, 1.064-4.5 in., 2S-F, 42.6¢ to 39.1¢; cold finished, 0.375-3.499 in., 2S-F, 46.9¢ to 41.4¢.

**Screw Machine Stock:** Rounds, 11S-T3, ¼-11/32 in., 62.5¢ to 49.1¢; ⅝-1½ in., 48.9¢ to 45.9¢; 1 9/16-3 in., 44.7¢ to 41.7¢. Base 5000 lb.

**Drawn Wire:** Coiled, 0.051-0.374 in., 2S, 46.1¢ to 34.8¢; 52S, 55.7¢ to 43.4¢; 17S-T4, 63.3¢ to 48.7¢; 61S-T4, 58.5¢ to 43.1¢.

**Extruded Tubing:** Rounds, 63S-T5, OD 1¼-2 in., 43.4¢ to 63.8¢; 2-4 in., 39.3¢ to 53.6¢; 4-6 in., 39.8¢ to 48.8¢; 6-9 in., 40.4¢ to 51.1¢.

**Roofing Sheet:** Flat, per sheet, 0.032-in. 42¾ x 60-in., $2.918; x 96-in., $4.672; x 120-in., $5.841; x 144-in., $7.009. Coiled sheet, per lb, 0.019 in. x 28 in., 29.9¢.

### Magnesium

*(F.o.b. mill, freight allowed)*

**Sheet & Plate:** FS1-O ¼ in., 56¢; 3/16 in., 57¢; ⅛ in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

**Extruded Round Rod:** M, diam ⅛ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ⅜ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

**Extruded Solid Shapes: Rectangles:** M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

**Extruded Round Tubing:** M, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

*(10,000 lb base, f.o.b. mill)*

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $11; Bar, HR or forged, $6; Forgings, $6.

### Nickel, Monel, Inconel

*(Base prices, f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 86½ | 67½ | 92½ |
| Strip, CR | 92½ | 70½ | 98½ |
| Rod, bar | 82½ | 65½ | 88½ |
| Angles, HR | 82½ | 65½ | 88½ |
| Plate, HR | 84½ | 66½ | 90½ |
| Seamless tube | 115½ | 100½ | 137½ |
| Shot, blocks | | 60 | |

### Copper, Brass, Bronze

*(Freight included on 500 lb)*

| | Sheet | Rods | Extruded Shapes |
|---|---|---|---|
| Copper | 46.41 | | 48.48 |
| Copper, h-r | 48.33 | 44.73 | |
| Copper, drawn | | 45.98 | |
| Low brass | 44.47 | 44.41 | |
| Yellow brass | 41.72 | 41.66 | |
| Red brass | 45.44 | 45.38 | |
| Naval brass | 45.76 | 40.07 | |
| Leaded brass | | | 39.11 |
| Com. bronze | 46.95 | 46.89 | |
| Mang. bronze | 49.48 | 43.62 | 45.18 |
| Phos. bronze | 66.53 | 67.08 | |
| Muntz metal | 43.96 | 39.77 | 41.02 |
| Ni silver, 10 pct | 55.36 | | 62.63 |

Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.

| | |
|---|---|
| Strip | $1.68 |
| Rod, bar, wire | 1.65 |

## PRIMARY METALS

*(Cents per lb, unless otherwise noted)*

| | |
|---|---|
| Aluminum ingot, 99+%, 10,000 lb, freight allowed | 22.20 |
| Aluminum pig | 20.50 |
| Antimony, American, Laredo, Tex. | 28.50 |
| Beryllium copper, per lb conta'd be. | $40.00 |
| Beryllium aluminum 5% Be, Dollars per lb contained Be | $72.75 |
| Bismuth, ton lots | $2.25 |
| Cadmium, del'd | $1.70 |
| Cobalt, 97-99% (per lb) | $2.60 to $2.67 |
| Copper, electro, Conn. Valley | 30.00 |
| Copper, Lake, delivered | 30.00 |
| Gold, U. S. Treas., per troy oz. | $35.00 |
| Indium, 99.8%, dollars per troy oz. | $2.25 |
| Iridium, dollars per troy oz. | $165 to $175 |
| Lead, St. Louis | 14.55 |
| Lead, New York | 14.70 |
| Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig | 27.00 |
| ingot | 27.75 |
| Magnesium, sticks, 100 to 500 lb, | 46.00 to 48.00 |
| Mercury, dollars per 76-lb flask, f.o.b. New York | $303 to $305 |
| Nickel electro, f.o.b. N. Y. warehouse | 63.08 |
| Nickel oxide sinter, at Copper Creek, Ont., contained nickel | 56.25 |
| Palladium, dollars per troy oz. | $21.00 |
| Platinum, dollars per troy oz. | $84 to $87 |
| Silver, New York, cents per troy oz. | 85.25 |
| Tin, New York | 93.375 |
| Titanium, sponge, grade A-1 | $4.72 |
| Zinc, East St. Louis | 11.50 |
| Zinc, New York | 12.00 |
| Zirconium copper, 50 pct. | $6.20 |

## REMELTED METALS

### Brass Ingot

*(Cents per lb delivered, carloads)*

| | |
|---|---|
| 85-5-5-5 ingot | |
| No. 115 | 28.50 |
| No. 120 | 27.75 |
| No. 123 | 27.25 |
| 80-10-10 ingot | |
| No. 305 | 33.00 |
| No. 315 | 30.75 |
| 88-10-2 ingot | |
| No. 210 | 41.75 |
| No. 215 | 38.25 |
| No. 245 | 33.75 |
| Yellow ingot | |
| No. 405 | 24.25 |
| Manganese bronze | |
| No. 421 | 26.75 |

### Aluminum Ingot

*(Cents per lb del'd 30,000 lb and over)*

| | |
|---|---|
| 95-5 aluminum-silicon alloys | |
| 0.30 copper, max. | 23.50-23.75 |
| 0.60 copper, max. | 23.25-23.50 |
| Piston alloys (No. 122 type) | 20.50-21.75 |
| No. 12 alum. (No. 2 grade) | 19.75-20.25 |
| 108 alloy | 20.75-21.00 |
| 195 alloy | 20.50-22.00 |
| 13 alloy (0.60 copper max.) | 23.25-23.50 |
| ASX-679 | 20.75-21.00 |

### Steel deoxidizing aluminum, notch-bar granulated or shot

| | |
|---|---|
| Grade 1—96-97½% | 21.00-21.50 |
| Grade 2—92-95% | 20.00-20.50 |
| Grade 3—90-92% | 19.00-19.50 |
| Grade 4—85-90% | 18.00-18.50 |

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, freight allowed, 5000 lb lots)*

| | |
|---|---|
| Copper | |
| Cast, oval, 15 in. or longer | 42.64 |
| Electrodeposited | 41.88 |
| Flat rolled | 45.04 |
| Brass, 80-20 | |
| Cast, oval, 15 in. or longer | 43.515 |
| Zinc, flat cast | 20.25 |
| Ball, anodes | 18.50 |
| Nickel, 99 pct plus | |
| Cast | 84.00 |
| Cadmium | $1.70 |
| Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn. | 94⅛ |

### Chemicals

*(Cents per lb, f.o.b. shipping points)*

| | |
|---|---|
| Copper cyanide, 100 lb drum | 63.00 |
| Copper sulphate, 99.5 crystals, bbl. | 12.85 |
| Nickel salts, single or double, 4-100 lb bags, frt. allowed | 30.00 |
| Nickel chloride, 375 lb drum | 38.00 |
| Silver cyanide, 100 oz. lots, per oz. | 75½ |
| Sodium cyanide, 96 pct domestic 200 lb drums | 19.25 |
| Zinc cyanide, 100 lb drum | 54.30 |

## SCRAP METALS

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 26 | 25¼ |
| Yellow brass | 19¾ | 18 |
| Red brass | 23 | 22½ |
| Comm. bronze | 23⅞ | 23½ |
| Mang. bronze | 18¼ | 17⅜ |
| Yellow brass rod ends | 19½ | |

### Custom Smelters' Scrap

*(Cents per pound carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 27¼ |
| No. 2 copper wire | 25¾ |
| Light copper | 24¼ |
| *Refinery brass | 24 —24¼ |

*Dry copper content.

### Ingot Makers' Scrap

*(Cents per pound carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 27 —27¼ |
| No. 2 copper wire | 25½ |
| Light copper | 24 |
| No. 1 composition | 21½—22 |
| No. 1 comp. turnings | 21 —21½ |
| Rolled brass | 17½—18 |
| Brass pipe | 18½—19 |
| Radiators | 18 —18½ |
| *Aluminum* | |
| Mixed old cast | 13¼—13¾ |
| Mixed new clips | 14 —14¼ |
| Mixed turnings, dry | 13½—14 |
| Pots and pans | 13¼—13¾ |

### Dealers' Scrap

*(Dealers' buying price, f.o.b. New York in cents per pound)*

#### Copper and Brass

| | |
|---|---|
| No. 1 heavy copper and wire | 24¾—25¼ |
| No. 2 heavy copper and wire | 23¼—23¾ |
| Light copper | 21¼—21¾ |
| New type shell cuttings | 21½ |
| Auto radiators (unsweated) | 16 —16½ |
| No. 1 composition | 19½ |
| No. 1 composition turnings | 19 |
| Unlined red car boxes | 16½ |
| Cocks and faucets | 16½—17 |
| Mixed heavy yellow brass | 13½ |
| Old rolled brass | 16 |
| Brass pipe | 17 |
| New soft brass clippings | 18 |
| Brass rod ends | 16 |
| No. 1 brass rod turnings | 15 |

#### Aluminum

| | |
|---|---|
| Alum. pistons and struts | 7 — 8 |
| Aluminum crankcases | 11 |
| 2S aluminum clippings | 14½ |
| Old sheet and utensils | 11 |
| Borings and turnings | 7 — 7½ |
| Misc. cast aluminum | 11 |
| Dural clips (24S) | 12½ |

#### Zinc

| | |
|---|---|
| New zinc clippings | 7 |
| Old zinc | 5½ |
| Zinc routings | 3½— 3¾ |
| Old die cast scrap | 3¼— 3½ |

#### Nickel and Monel

| | |
|---|---|
| Pure nickel clippings | 60 —65 |
| Clean nickel turnings | 40 |
| Nickel anodes | 60 —65 |
| Nickel rod ends | 60 —65 |
| New Monel clippings | 23 —25 |
| Clean Monel turnings | 16 —18 |
| Old sheet Monel | 21 —23 |
| Nickel silver clippings, mixed | 15 |
| Nickel silver turnings, mixed | 13 |

#### Lead

| | |
|---|---|
| Soft scrap lead | 11¾ |
| Battery plates (dry) | 6¼— 6½ |
| Batteries, acid free | 4¼— 4½ |

#### Magnesium

| | |
|---|---|
| Segregated solids | 18½—19 |
| Castings | 17½—18 |

#### Miscellaneous

| | |
|---|---|
| Block tin | 75 —80 |
| No. 1 pewter | 55 —60 |
| No. 1 auto babbitt | 48 |
| Mixed common babbitt | 12 —12½ |
| Solder joints | 17½ |
| Siphon tops | 45 |
| Small foundry type | 16½ |
| Monotype | 15 |
| Lino. and stereotype | 14 |
| Electrotype | 12½ |
| Hand picked type shells | 9½ |
| Lino. and stereo. dross | 6½ |
| Electro dross | 5 |

# Composite Price at '54 High

**Iron Age scrap composite price hits $30.17 . . . 67¢ over last week . . . Highest figure this year . . . Chicago market leads climb . . . Railroad grades strengthen.**

◆ CONTINUING higher market activity in most scrap consuming areas raised THE IRON AGE Heavy Melting Steel Scrap Composite Price again this week. Current quotation is $30.17, up 67¢ from last week and the highest weekly figure since Dec. 29, 1953.

Increases were not confined to steelmaking grades. Electric furnace grades also rose, as did turnings. Greatest strength was in railroad items, particularly in the Midwest. In Chicago, for example, reroller rails and car axles advanced by as much as $5 per ton. Cast increases, while not universal, were a noticeable factor in several areas.

East Coast markets remained steady this week, after having led the overall rise last week. Continuing buying by domestic mills in the East was viewed as an encouraging sign, even though orders were on the light side. Some traders had been worried by the fact that export business alone had sustained the market for so long.

There seemed to be little doubt that the market strengthening was widespread. Even those areas not reporting concrete price rises indictated a firmer market tone, belief that new orders would be at higher prices.

**Pittsburgh** . . . Openhearth scrap prices advanced $1 per ton this week. Broker buying to fill old orders, plus greater strength in other districts justifies higher prices in this area. Under present conditions, local consumers would be unable to bring material into the area without offering more money. A large consumer reportedly is planning to re-enter the market soon for October requirements at one of its plants.

**Chicago** . . . After a 4-week lull with prices holding despite negligible mill purchasing, Chicago's scrap market began to step out last week. Leading the advance reroller rails and car axles advanced by as much as $5 and nearly all grades advanced by a dollar as consumer resistance began to weaken following a midweek purchase of No. 2 bundles and No. 2 heavy melting at $23 and $29 respectively. Mill purchases of No. 1 grades at previous prices failed to halt the rising dealer price. And spot sales of small tonnages of melting grades, electric furnace and even cast, at advanced prices suggested the market upswing had not halted.

**Philadelphia** . . . Steelmaking grades remain firm at current prices with export business continuing and inquiries beginning to come more frequently from domestic mills. Several grades of blast furnace scrap moved higher this week and a forthcoming sale of low phos material is expected to bolster that market. Higher prices for good machinery cast have widened the spread to $40 to $42 per gross ton.

**New York** . . . Continuing market activity confirmed last week's price advances. Exports still dominate the market here, but domestic sales, while on the light side, are steady.

**Detroit** . . . Prices were hard to pin down as brokers varied their buying prices to fill orders. While mills insisted that the strength was "only in dealers' minds," it took at least $1 more this week to cover than it did a week ago. Strength was confined mostly to No. 2 grades although just about all classifications of both openhearth and blast furnace scrap eased upward.

**Cleveland** . . . No. 1 Heavy melting went up $2 at top range in Cleveland on basis of nominal tonnage sales to two area mills. This was the first significant movement in 6 weeks. Sales also strengthened markets for other grades with rises all down the line. Railroad scrap was also especially strong. Continued improvement is expected through October and November, especially by dealers. One additional blast furnace was started in the area this week however to forestall a price surge and additional startups may be made. Valley market is also stronger.

**Birmingham** . . . Steel scrap is moving moderately well, with most dealers rapidly turning over their purchases. Soil and pressure pipe business is good because of the federal housing program, and most plants in the district are running at capacity. Cast scrap is moving well at the increased prices, coming into the district from as far away as Minnesota, Nebraska and New Mexico.

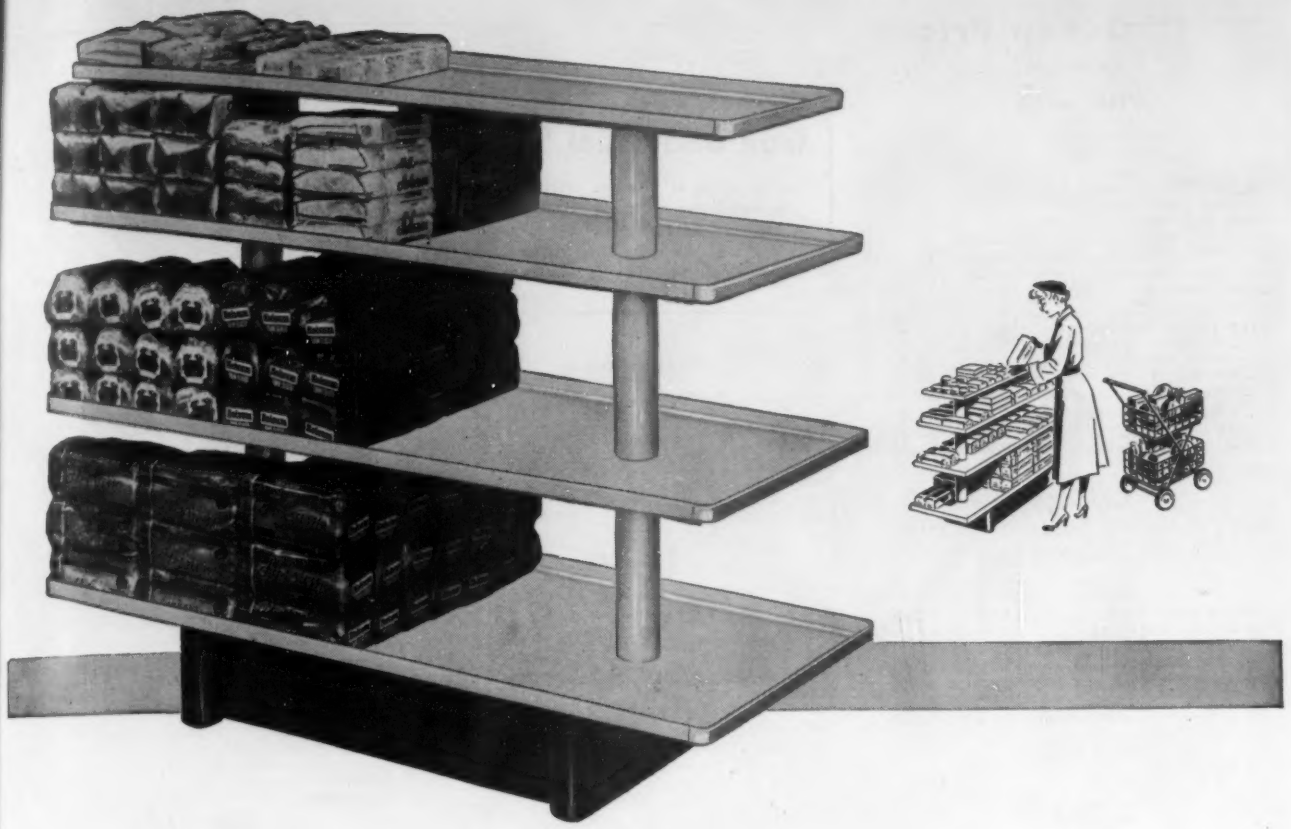
**St. Louis** . . . Interest in the St. Louis scrap market centers in lists of three railroads closing this weekend for a total of 179 carloads of various items. It is expected that the material will bring prices now prevailing unless there is speculative buying by one or more brokers.

**Cincinnati** . . . Market continues dull but dealers are hopeful of increased strength in sympathy with stronger northern Ohio market. No end of month purchases made or in sight. One producer seeking No. 1 heavy melting but dealers are declining the offered price in hope of upturn.

**Buffalo** . . . Fresh demand has turned scrap market to the sellers side. Dealers are reluctant to accept additional orders at current advanced prices. Mill buying raised No. 1 heavy melting $1 a ton. A 4-point increase in steel production has bolstered sentiment. Brisk Canadian buying boosted cast scrap a dollar.

**Boston** . . . While steelmaking grades continue to move in the export picture, there has not been much improvement in general activity. Nevertheless, prices are holding steady at the recently increased levels. A few cars of unstripped motor blocks moved last week, boosting the price $1 per ton.

**West Coast** . . . Picture is unchanged. Another cargo for export, half each from Oakland and Los Angeles. Two small mills are still on strike. One Los Angeles mill tapped first heat on its third openhearth, out of use since last spring. Cast scrap remains strong in San Francisco, weaker in Seattle and Los Angeles.



# The finish was only the beginning

A baked-enamel finish applied to Republic Electro Paintlok was the beginning of customer-attracting appearance and longer service life for this bakery goods display.

The unit is made by Modern Metal Products Company, Greensboro, N. C.

Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them for years.

Selection of Electro Paintlok for this application was based on the company's success in fabricating it for other products. They knew the tight zinc coating would not crack, peel or flake during normal fabricating operations.

They also knew their entire finishing operation would be speeded.

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**REPUBLIC STEEL CORPORATION**
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**Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron**

# Scrap Prices

*(Effective Sept. 21, 1954)*

## Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $31.00 to $32.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 bundles | 31.00 to 32.00 |
| No. 2 bundles | 25.00 to 26.00 |
| Machine shop turn. | 16.00 to 17.00 |
| Mixed bor. and ms. turns. | 16.00 to 17.00 |
| Shoveling turnings | 20.00 to 21.00 |
| Cast iron borings | 19.00 to 20.00 |
| Low phos. punch'gs, plate | 34.00 to 35.00 |
| Heavy turnings | 28.00 to 29.00 |
| No. 1 RR. hvy. melting | 33.00 to 34.00 |
| Scrap rails, random lgth. | 37.00 to 38.00 |
| Rails 2 ft and under | 43.00 to 44.00 |
| RR. steel wheels | 35.00 to 36.00 |
| RR. spring steel | 35.00 to 36.00 |
| RR. couplers and knuckles | 35.00 to 36.00 |
| No. 1 machinery cast. | 42.00 to 43.00 |
| Cupola cast. | 35.00 to 36.00 |
| Heavy breakable cast. | 30.00 to 31.00 |

## Chicago

| | |
|---|---|
| No. 1 hvy. melting | $30.00 to $31.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 factory bundles | 32.00 to 33.00 |
| No. 1 dealers' bundles | 30.00 to 31.00 |
| No. 2 dealers' bundles | 22.00 to 23.00 |
| Machine shop turn. | 14.00 to 15.00 |
| Mixed bor. and turn. | 16.00 to 17.00 |
| Shoveling turnings | 16.00 to 17.00 |
| Cast iron borings | 16.00 to 17.00 |
| Low phos. forge crops | 36.00 to 37.00 |
| Low phos. punch'gs, plate | 33.00 to 35.00 |
| Low phos. 3 ft and under | 32.00 to 34.00 |
| No. 1 RR. hvy. melting | 33.00 to 34.00 |
| Scrap rails, random lgth. | 39.00 to 40.00 |
| Rerolling rails | 48.00 to 50.00 |
| Rails 2 ft and under | 46.00 to 47.00 |
| Locomotive tires, cut | 34.00 to 35.00 |
| Cut bolsters & side frames | 36.00 to 37.00 |
| Angles and splice bars | 38.00 to 39.00 |
| RR. steel car axles | 48.00 to 49.00 |
| RR. couplers and knuckles | 36.00 to 37.00 |
| No. 1 machinery cast. | 42.00 to 43.00 |
| Cupola cast. | 38.00 to 39.00 |
| Heavy breakable cast. | 31.00 to 32.00 |
| Cast iron brake shoes | 33.00 to 34.00 |
| Cast iron car wheels | 34.00 to 35.00 |
| Malleable | 40.00 to 42.00 |
| Stove plate | 29.00 to 31.00 |

## Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $28.00 to $29.00 |
| No. 2 hvy. melting | 26.00 to 27.00 |
| No. 1 bundles | 28.00 to 29.00 |
| No. 2 bundles | 22.00 to 23.00 |
| Machine shop turn. | 15.50 to 16.50 |
| Mixed bor. short turn. | 18.00 to 19.00 |
| Cast iron borings | 18.00 to 19.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Clean cast chem. borings | 22.00 to 23.00 |
| Low phos. 5 ft and under | 29.00 to 30.00 |
| Low phos. 2 ft and under | 30.00 to 31.00 |
| Low phos. punch'gs | 30.00 to 31.00 |
| Elec. furnace bundles | 28.00 to 29.00 |
| Heavy turnings | 26.00 to 27.00 |
| RR. steel wheels | 32.00 to 33.00 |
| RR. spring steel | 32.00 to 33.00 |
| Rails 18 in. and under | 42.00 to 43.00 |
| Cupola cast. | 34.00 to 35.00 |
| Heavy breakable cast. | 35.00 to 36.00 |
| Cast iron carwheels | 38.00 to 39.00 |
| Malleable | 36.00 to 37.00 |
| Unstripped motor blocks | 27.00 to 28.00 |
| No. 1 machinery cast. | 40.00 to 42.00 |
| Charging box cast. | 36.00 to 37.00 |

## Cleveland

| | |
|---|---|
| No. 1 hvy. melting | $30.00 to $31.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 bundles | 30.00 to 31.00 |
| No. 2 bundles | 25.50 to 26.50 |
| No. 1 busheling | 30.00 to 31.00 |
| Machine shop turn. | 13.00 to 14.00 |
| Mixed bor. and turn. | .... 18.00 |
| Shoveling turnings | .... 18.00 |
| Cast iron borings | .... 18.00 |
| Cut struct'r'l & plates, 2 ft & under | 34.00 to 35.00 |
| Drop forge flashings | 29.00 to 30.00 |
| Low phos. 2 ft & under | 30.00 to 32.00 |
| No. 1 RR. heavy melting | 30.00 to 31.00 |
| Rails 3 ft and under | 45.00 to 46.00 |
| Rails 18 in. and under | 46.00 to 47.00 |
| Railroad grate bars | 27.00 to 28.00 |
| Steel axle turnings | 19.00 to 20.00 |
| Railroad cast. | 43.00 to 44.00 |
| No. 1 machinery cast. | 43.00 to 44.00 |
| Stove plate | 34.00 to 35.00 |
| Malleable | 43.00 to 44.00 |

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

| | |
|---|---|
| No. 1 hvy. melting | $31.00 to $32.00 |
| No. 2 hvy. melting | 26.00 to 27.00 |
| No. 1 bundles | 31.00 to 32.00 |
| No. 2 bundles | 23.00 to 24.00 |
| Machine shop turn. | 14.00 to 15.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Cast iron borings | 19.00 to 20.00 |
| Low phos. plate | 32.00 to 33.00 |

## Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $28.00 to $29.00 |
| No. 2 hvy. melting | 22.50 to 23.50 |
| No. 1 busheling | 28.00 to 29.00 |
| No. 1 bundles | 28.00 to 29.00 |
| No. 2 bundles | 20.50 to 21.50 |
| Machine shop turn. | 15.00 to 16.00 |
| Mixed bor. and turn. | 18.00 to 19.00 |
| Shoveling turnings | 18.50 to 19.50 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos. plate | 30.00 to 31.00 |
| Scrap rails, random lgth. | 33.00 to 34.00 |
| Rails 2 ft and under | 40.00 to 41.00 |
| RR. steel wheels | 34.00 to 35.00 |
| RR. spring steel | 34.00 to 35.00 |
| RR. couplers and knuckles | 34.00 to 35.00 |
| No. 1 machinery cast. | 39.00 to 40.00 |
| No. 1 cupola cast. | 35.00 to 36.00 |

## Detroit

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $23.00 to $24.00 |
| No. 2 hvy. melting | 20.00 to 21.00 |
| No. 1 bundles, openhearth | 24.50 to 25.50 |
| No. 2 bundles | 18.00 to 19.00 |
| New busheling | 23.00 to 24.00 |
| Drop forge flashings | 23.00 to 24.00 |
| Machine shop turn. | 11.00 to 12.00 |
| Mixed bor. and turn. | 13.00 to 14.00 |
| Shoveling turnings | 13.50 to 14.50 |
| Cast iron borings | 13.50 to 14.50 |
| Low phos. punch'gs, plate | 23.00 to 24.00 |
| No. 1 cupola cast. | .... 33.00 |
| Heavy breakable cast. | .... 24.00 |
| Stove plate | .... 29.00 |
| Automotive cast. | .... 37.00 |

## St. Louis

| | |
|---|---|
| No. 1 hvy. melting | $26.00 to $27.00 |
| No. 2 hvy. melting | 24.50 to 25.50 |
| No. 1 bundles | 26.00 to 27.00 |
| No. 2 bundles | 20.50 to 21.50 |
| Machine shop turn. | 13.50 to 14.00 |
| Cast iron borings | 14.00 to 15.00 |
| Shoveling turnings | 15.00 to 16.00 |
| No. 1 RR. hvy. melting | 32.50 to 33.50 |
| Rails, random lengths | 35.00 to 36.00 |
| Rails, 18 in. and under | 42.00 to 43.00 |
| Locomotive tires, uncut | 32.00 to 33.00 |
| Angles and splice bars | 34.00 to 35.00 |
| Std. steel car axles | 35.00 to 36.00 |
| RR. spring steel | 32.00 to 33.00 |
| Cupola cast | 42.00 to 43.00 |
| Hvy. breakable cast. | 31.00 to 32.00 |
| Cast iron brake shoes | 26.00 to 27.00 |
| Stove plate | 36.50 to 37.50 |
| Cast iron car wheels | 32.00 to 33.00 |
| Malleable | 35.00 to 36.00 |
| Unstripped motor blocks | 30.00 to 31.00 |

## New York

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $21.50 to $22.50 |
| No. 2 hvy. melting | 18.50 to 19.50 |
| No. 2 bundles | 15.00 to 16.00 |
| Machine shop turn. | 7.00 to 8.00 |
| Mixed bor. and turn. | 9.00 to 10.00 |
| Shoveling turnings | 11.50 to 12.50 |
| Clean cast chem. borings | 16.00 to 17.00 |
| No. 1 machinery cast. | 35.00 to 36.00 |
| Mixed yard cast. | 29.00 to 30.00 |
| Charging box cast. | 29.00 to 30.00 |
| Heavy breakable cast. | 27.00 to 28.00 |
| Unstripped motor blocks | 22.00 to 23.00 |

## Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $23.50 to $24.50 |
| No. 2 hvy. melting | .... 22.50 |
| No. 1 bundles | .... 23.50 |
| No. 2 bundles | 17.00 to 18.00 |
| No. 1 busheling | .... 23.50 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 16.00 to 17.00 |
| Cast iron borings | 15.00 to 16.00 |
| Electric furnace bundles | 28.00 to 29.00 |
| Bar crops and plate | 30.50 to 31.50 |
| Structural and plate, 2 ft | 30.50 to 31.50 |
| No. 1 RR. hvy. melting | 28.00 to 29.00 |
| Scrap rails, random lgth. | 35.00 to 36.00 |
| Rails, 18 in. and under | 39.00 to 40.00 |
| Angles & splice bars | 37.00 to 38.00 |
| Rerolling rails | 39.50 to 40.00 |
| No. 1 cupola cast. | 45.00 to 46.00 |
| Stove plate | 42.00 to 43.00 |
| Charging box cast. | 19.00 to 20.00 |
| Cast iron car wheels | 33.00 to 34.00 |
| Unstripped motor blocks | 35.00 to 36.00 |
| Mashed tin cans | 15.00 to 16.00 |

## Boston

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $19.00 to $20.00 |
| No. 2 hvy. melting | 14.00 to 15.00 |
| No. 1 bundles | 19.00 to 20.00 |
| No. 2 bundles | 14.00 to 15.00 |
| No. 1 busheling | 19.00 to 20.00 |
| Elec. furnace, 3 ft & under | 19.00 to 20.00 |
| Machine shop turn. | 4.00 to 5.00 |
| Mixed bor. and short turn. | 9.00 to 10.00 |
| Shoveling turnings | 10.00 to 11.00 |
| Clean cast chem. borings | 11.00 to 12.00 |
| No. 1 machinery cast. | 29.00 to 30.00 |
| Mixed cupola cast. | 26.00 to 27.00 |
| Heavy breakable cast. | 25.00 to 25.50 |
| Stove plate | 25.00 to 26.00 |
| Unstripped motor blocks | 17.00 to 18.00 |

## Cincinnati

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $25.50 to $26.50 |
| No. 2 hvy. melting | 22.50 to 23.50 |
| No. 1 bundles | 26.00 to 27.00 |
| No. 2 bundles | 19.00 to 20.00 |
| Machine shop turn. | 11.00 to 12.00 |
| Mixed bor. and turn. | 14.50 to 15.50 |
| Shoveling turnings | 14.50 to 15.50 |
| Cast iron borings | 14.50 to 15.50 |
| Low phos., 18 in. & under | 33.00 to 34.00 |
| Rails, random lengths | 36.00 to 37.00 |
| Rails, 18 in. and under | 44.00 to 45.00 |
| No. 1 cupola cast. | 38.00 to 39.00 |
| Hvy. breakable cast. | 34.00 to 35.00 |
| Drop broken cast. | 43.00 to 44.00 |

## San Francisco

| | |
|---|---|
| No. 1 hvy. melting | .... $20.00 |
| No. 2 hvy. melting | .... 16.00 |
| No. 1 bundles | .... 19.00 |
| No. 2 bundles | .... 16.00 |
| No. 3 bundles | .... 13.00 |
| Machine shop turn. | .... 5.00 |
| Cast iron borings | .... 8.00 |
| No. 1 RR. hvy. melting | .... 20.00 |
| No. 1 cupola cast. | $40.00 to 42.00 |

## Los Angeles

| | |
|---|---|
| No. 1 hvy. melting | .... $20.00 |
| No. 2 hvy. melting | .... 16.00 |
| No. 1 bundles | .... 19.00 |
| No. 2 bundles | $15.50 to 16.00 |
| No. 3 bundles | .... 13.00 |
| Machine shop turn. | .... 5.00 |
| Shoveling turnings | 7.00 to 9.00 |
| Cast iron borings | 7.00 to 9.00 |
| Elec. fur. 1 ft and under | .... 25.00 |
| No. 1 RR. hvy. melting | .... 20.00 |
| No. 1 cupola cast. | 40.00 to 42.00 |

## Seattle

| | |
|---|---|
| No. 1 hvy. melting | .... $25.00 |
| No. 2 hvy. melting | .... 21.00 |
| No. 1 bundles | .... 21.50 |
| No. 2 bundles | .... 17.00 |
| No. 3 bundles | .... 13.00 |
| No. 1 cupola cast. | .... 35.00 |
| Mixed yard cast. | .... 35.00 |

## Hamilton, Ont.

| | |
|---|---|
| No. 1 hvy. melting | .... $22.00 |
| No. 2 hvy. melting | .... 19.00 |
| No. 1 bundles | .... 22.00 |
| No. 2 bundles | .... 19.00 |
| Mixed steel scrap | .... 16.00 |
| Bushelings | .... 17.00 |
| Bush., new fact prep'd | .... 20.00 |
| Bush., new fact unprep'd | .... 16.00 |
| Short steel turnings | .... 12.00 |
| Mixed bor. and turn. | .... 12.00 |
| Rails, remelting | .... 31.00 |
| Cast scrap | $42.00 to 45.00 |

# A SYMBOL OF LEADERSHIP IN IRON & STEEL SCRAP SINCE 1889

## *Luria Brothers and Company, Inc.*

MAIN OFFICE

**LINCOLN-LIBERTY BLDG.**

Philadelphia 7, Penna.

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| | | |
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EXPORTS-IMPORTS — LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

IRON AGE

# STEEL PRICES

*(Effective Sept. 21, 1954)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BILLETS, BLOOMS, SLABS | | | PIL-ING | SHAPES STRUCTURALS | | | STRIP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide-Flange | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot-rolled | Alloy Cold-rolled |
| EAST | Bethlehem, Pa. | | | $86.00 *B3* | | 4.30 *B3* | 6.45 *B3* | 4.30 *B3* | | | | | | |
| | Buffalo, N. Y. | $64.00 *B3* | $78.00 *B3, R3* | $86.00 *B3, R3* | 5.075 *B3* | 4.30 *B3* | 6.45 *B3* | 4.30 *B3* | 4.05 *B3,R3* | 5.75 *B3,R7* | 6.15 *B3* | 8.425 *B3* | | |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | | | | | | | | 4.175 *A2* | | 6.15 *A2* | | | |
| | New Bedford, Mass. | | | | | | | | | 6.20 *R6* | | | | |
| | Harrison, N. J. | | | | | | | | | | | | | |
| | Johnstown, Pa. | $64.00 *B3* | $78.00 *B3* | $86.00 *B3* | | 4.30 *B3* | 6.45 *B3* | | 4.05 *B3* | | | | | |
| | Fairless, Pa. | | | | | | | | | | | | | |
| | New Haven, Conn. | | | | | | | | | 6.20 *D1* 6.50 *A5* | | | | |
| | Phoenixville, Pa. | | | | | 3.95 *P2* | | 3.95 *P2* | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 4.05 *B3* | 5.75 *B3* | 6.15 *B3* | 8.425 *B3* | | |
| | Wallingford, Conn. | | | | | | | | | 6.20 *W1* | | | | |
| | Worcester, Mass. Pawtucket, R. I. | | | | | | | | | 6.30 *N7* 6.60 *A5* | | | | 12.75 *A5* 12.80 *N7* |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 4.225 *L1* | | | | | |
| | Ashland, Ky. | | | | | | | | 4.05 *A7* | | | | | |
| | Canton-Massillon, Dover, Ohio | | $88.00 *R3* | $82.00 *T5* $86.00 *R3* | | | | | | | | | | 12.45 *G1* |
| | Chicago, Ill. | $64.00 *U1* | $78.00 *R3, U1,W8* | $86.00 *U1, W8,R3* | 5.075 *U1* | 4.25 *U1, W8* | 6.40 *U1, Y1* | 4.25 *U1* | 4.05 *A1,N4, W8* | 5.85 *A1* | | | | |
| | Cleveland, Ohio | | | | | | | | | 5.75 *A5,J3* | | 8.60 *A5* | | 12.45 *A5* |
| | Detroit, Mich. | | | $86.00 *R5* | | | | | 4.20 *G3,M2* | 5.90 *D1,D2, G3,M2,P11* | 6.30 *G3* | 8.75 *D2, G3* | | |
| | Duluth, Minn. | | | | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | $64.00 *U1* | $78.00 *U1* | $86.00 *U1, Y1* | 5.075 *I3* | 4.25 *I3, U1* | 6.40 *U1, I3* | | 4.05 *I3, U1,Y1* | 6.00 *I3* | 6.15 *U1, I3,Y1* | 8.60 *Y1* | 6.70 *U1, Y1* | |
| | Sterling, Ill. | | | | | | | | 4.15 *N4* | | | | | |
| | Indianapolis, Ind. | | | | | | | | | 5.90 *C3* | | | | |
| | Newport, Ky. | | | | | | | | | | | | 6.70 *N5* | |
| | Middletown, Ohio | | | | | | | | | 5.75 *A7* | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | | | | | | | | 4.05 *S1,R3* | 5.75 *S1,R3, T4* | 6.15 *S1, R3* | 8.60 *S1,R3* | 6.70 *S1* | 12.45 *S1* |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | $64.00 *U1, J3* | $78.00 *J3, U1,C11* | $86.00 *U1, C11* | 5.075 *U1* | 4.25 *J3, U1* | 6.40 *J3, U1* | 4.25 *U1* | 4.05 *S7,P6* | 5.75 *B4,J3 S7* | | | 6.70 *S9* | 12.45 *S9* |
| | Portsmouth, Ohio | | | | | | | | 4.05 *P7* | 5.75 *P7* | | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | | 4.25 *W3* | | | 4.05 *W3* | 5.75 *F3, W3* | 6.15 *W3* | 8.60 *W3* | | |
| | Youngstown, Ohio | | $78.00 *C10* | $86.00 *Y1, C10* | | 4.25 *Y1* | 6.40 *Y1* | | 4.05 *U1,Y1* | 5.75 *Y1,C5* | 6.15 *U1, Y1* | 8.60 *Y1* | 6.70 *U1, Y1* | 12.45 *C5* |
| WEST | Fontana, Cal. | $72.00 *K1* | $86.00 *K1* | $105.00 *K1* | | 4.90 *K1* | 7.05 *K1* | 5.25 *K1* | 4.825 *K1* | 7.65 *K1* | 7.25 *K1* | | 8.10 *K1* | 14.55 *K1* |
| | Geneva, Utah | | $78.00 *C7* | | | 4.25 *C7* | 6.40 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | 4.85 *S2* | 7.00 *S2* | | 4.65 *S2* | | | | 7.30 *S2* | |
| | Los Angeles, Torrance, Cal. | | $87.50 *B2* | $106.00 *B2* | | 4.95 *B2, C7* | 7.10 *B2* | | 4.80 *B2,C7* | 7.80 *C1* | | | | |
| | Minnequa, Colo. | | | | | 4.70 *C6* | | | 5.15 *C6* | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | $87.50 *B2* | | | 4.90 *B2* 4.95 *P9* | 7.05 *B2* | | 4.80 *B2,C7* | | | | | |
| | Seattle, Wash. | | $91.50 *B2* | | | 5.00 *B2* | 7.15 *B2* | | 5.05 *B2, P12* | | | | | |
| SOUTH | Atlanta, Ga. | | | | | | | | 4.25 *A8* | | | | | |
| | Fairfield, Ala. City, Birmingham, Ala. | $64.00 *T2* | $78.00 *T2* | | | 4.25 *T2,C16* 4.28 *R3* | 6.40 *T2* | | 4.05 *R3, T2,C16* | | 6.15 *T2* | | | |
| | Houston, Tex. | | $85.00 *S2* | $93.00 *S2* | | 4.65 *S2* | 6.85 *S2* | | 4.45 *S2* | | | | 7.10 *S2* | |

# STEEL PRICES

*(Effective Sept. 21, 1954)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | SHEETS | | | | | | | | | WIRE ROD | TINPLATE† | | BLACK PLATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-rolled *18* ga. & hvyr. | Cold-rolled | Galvanized *10* ga. | Enameling *12* ga. | Long Terne *10* ga. | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | Hot-rolled *19* ga. | | Cokes* *1.25*-lb. base box | Electro* *0.25*-lb. base box | Holloware Enameling *29* ga. |
| EAST | Bethlehem, Pa. | | | | | | | | | | | | | |
| | Buffalo, N. Y. | 4.95 *B3* | 4.95 *B3* | | | | 6.10 *B3* | 7.50 *B3* | | | 4.675 *W6* | | | |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | 4.10 *A2* | | | | | 6.15 *A2* | | | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | | |
| | Johnstown, Pa. | | | | | | | | | | 4.675 *B3* | | | |
| | Fairless, Pa. | 4.10 *U1* | 5.00 *U1* | | | | 6.15 *U1* | 7.55 *U1* | | | | $8.80 *U1* | $7.50 *U1* | |
| | New Haven, Conn. | | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | | |
| | Sparrows Pt., Md. | 4.05 *B3* | 4.95 *B3* | 5.45 *B3* | | | 6.10 *B3* | 7.50 *B3* | 8.20 *B3* | | 4.775 *B3* | $8.80 *B3* | $7.50 *B3* | |
| | Worcester, Mass. | | | | | | | | | | 4.975 *A5* | | | |
| | Trenton, N. J. | | | | | | | | | | | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | | 4.85 *L1* | | | |
| | Ashland, Ky. | 4.05 *A7* | | 5.45 *A7* | 5.375 *A7* | | | | | | | | | |
| | Canton-Massillon, Dover, Ohio | | | 5.45 *R1,R3* | | | | | | 5.175 *R1* | | | | |
| | Chicago, Joliet, Ill. | 4.05 *A1, W8* | | | | | 6.10 *U1* | | | | 4.675 *A5, N4,R3* | | | |
| | Sterling, Ill. | | | | | | | | | | 4.775 *N4* | | | |
| | Cleveland, Ohio | 4.05 *J3, R3* | 4.95 *J3, R3* | | 5.375 *R3* | | 6.10 *J3, R3* | 7.50 *J3, R3* | | | 4.675 *A5* | | | |
| | Detroit, Mich. | 4.20 *G3, M2* | 5.10 *G3* | | | | 6.25 *G3* | 7.65 *G3* | | | | | | |
| | Newport, Ky. | 4.05 *N5* | | 5.45 *N5* | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 4.05 *I3, U1,Y1* | 4.95 *I3, U1,Y1* | 5.45 *U1, I3* | 5.375 *I3, U1* | 5.85 *U1* | 6.10 *U1,I3, Y1* | 7.50 *U1,Y1* | | | 4.675 *Y1* | $8.70 *I3, U1,Y1* | $7.40 *I3, U1,Y1* | 6.10 *U1, Y1* |
| | Granite City, Ill. | 4.25 *G2* | 5.15 *G2* | 5.65 *G2* | 5.575 *G2* | | | | | | | | $7.60 *G2* | 6.30 *G2* |
| | Kokomo, Ind. | 4.15 *C9* | | 5.55 *C9* | | | | | | 5.20 *C9* | 4.775 *C9* | | | |
| | Mansfield, Ohio | | | | | 5.85 *E2* | | | | 5.175 *E2* | | | | |
| | Middletown, Ohio | | 4.95 *A7* | | 5.375 *A7* | 5.85 *A7* | | | | | | | | |
| | Niles, Ohio Sharon, Pa. | 4.05 *S1,R3* 5.30 *N3* | 4.95 *R3* 5.975 *N3* | 5.45 *N3* | 6.725 *N3* | 5.85 *N3* | 6.10 *S1,R3* | 7.50 *R3* | | | | $8.70 *R3* | $7.40 *R3* | |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | 4.05 *J3, U1,P6* | 4.95 *J3, U1,P6* | 5.45 *U1* | 5.375 *U1* | | 6.10 *J3, U1* | 7.50 *J3, U1* | 8.20 *U1* | | 4.675 *A5* 4.875 *P6* | $8.70 *J3, U1* | $7.40 *J3, U1* | 6.10 *U1* |
| | Portsmouth, Ohio | 4.05 *P7* | 4.95 *P7* | | | | | | | | 4.675 *P7* | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.05 *W3, W5* | 4.95 *W3, W5,F3* | 5.45 *W3, W5* | | 5.85 *W3, W5* | 6.10 *W3* | 7.50 *W3* | | | | $8.70 *W3, W5* | $7.40 *W3, W5* | 6.10 *F3, W5* |
| | Youngstown, Ohio | 4.05 *U1, Y1* | 4.95 *Y1* | | 5.375 *Y1* | | 6.10 *U1, Y1* | 7.50 *Y1* | | | 4.675 *Y1* | | | |
| WEST | Fontana, Cal. | 4.825 *K1* | 6.05 *K1* | | | | 6.875 *K1* | 8.55 *K1* | | | 5.475 *K1* | | | |
| | Geneva, Utah | 4.15 *C7* | | | | | 6.45 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | | | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | | 5.475 *C7, B2* | | | |
| | Minnequa, Colo. | | | | | | | | | | 4.925 *C6* | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 4.75 *C7* | 5.90 *C7* | 6.20 *C7* | | | | | | | 5.325 *C7* | $9.45 *C7* | $8.15 *C7* | |
| | Seattle, Wash. | | | | | | | | | | | | | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | | | | |
| | Fairfield, Ala. Alabama City, Ala. | 4.05 *R3, T2* | 4.95 *T2* | 5.45 *R3, T2* | | | 6.10 *T2* | | | 5.35 *R3* | 4.675 *T2, R3* | $8.80 *T2* | $7.50 *T2* | |
| | Houston, Texas | 4.45 *S2* | | | | | | | | | 5.075 *S2* | | | |

† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box.

* COKES: 1.50 lb add 25¢.

ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢; 1.00-lb add $1.20.

# STEEL PRICES

*(Effective Sept. 21, 1954)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Steel | Reinforcing | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfg'g. Bright |
| EAST | Bethlehem, Pa. | | | | 5.075 *B3* | 6.625 *B3* | 6.45 *B3* | | | | | |
| | Buffalo, N. Y. | 4.30 *B3*<br>4.33 *R3* | 4.30 *B3*<br>4.33 *R3* | 5.45 *B5* | 5.075 *B3*<br>5.105 *R3* | 6.625 *B3,B5* | 6.45 *B3* | 4.225 *B3* | | | 6.45 *B3* | 5.75 *W6* |
| | Claymont, Del. | | | | | | | 4.225 *C4* | | 5.80 *C4* | | |
| | Contesville, Pa. | | | | | | | 4.225 *L4* | | 5.80 *L4* | | |
| | Conshohocken, Pa. | | | | | | | 4.225 *A2* | 5.275 *A2* | | 6.45 *A2* | |
| | Harrisburg, Pa. | | | | | | | 3.975 *C3* | 5.275 *C3* | | | |
| | Hartford, Conn. | | | 5.90 *R3* | | 6.925 *R3* | | | | | | |
| | Johnstown, Pa. | 4.30 *B3* | 4.30 *B3* | | 5.075 *B3* | | 6.45 *B3* | 4.225 *B3* | | 5.80 *B3* | 6.45 *B3* | 5.75 *B3* |
| | Fairless, Pa. | 4.45 *U1* | 4.45 *U1* | | 5.225 *U1* | | | | | | | |
| | Newark, N. J. | | | 5.85 *W10* | | 6.80 *W10* | | | | | | |
| | Camden, N. J. | | | 5.85 *P10* | | | | | | | | |
| | Putnam, Conn. | | | 5.95 *W10* | | | | | | | | |
| | Sparrows Pt., Md. | | 4.30 *B3* | | | | | 4.225 *B3* | | 5.80 *B3* | 6.45 *B3* | 5.85 *B3* |
| | Palmer, Worcester, Readville, Mansfield, Mass. | | | 5.85 *W11*<br>5.95 *B5,C14* | | 6.925 *A5,B5* | | | | | | 6.05 *A5, W6* |
| MIDDLE WEST | Alton, Ill. | 4.50 *L1* | | | | | | | | | | 5.925 *L1* |
| | Ashland, Newport, Ky. | | | | | | | 4.225 *A7,N5* | | 5.80 *N5* | | |
| | Canton-Massillon, Mansfield, Ohio | 4.46 *R3* | | 5.40 *R2*<br>5.44 *R3* | 4.875 *T5*<br>5.115 *R3* | 6.325 *T5*<br>6.625 *R2*<br>6.665 *R3* | | 4.225 *E2* | | | | |
| | Chicago, Joliet, Ill. | 4.30 *U1, N4,W8*<br>4.37 *R3* | 4.30 *N4*<br>4.37 *R3* | 5.40 *A5,W10, W8,B5,L2* | 5.075 *U1, W8*<br>5.145 *R3* | 6.625 *A5,W8, W10,L2, B5* | | 4.225 *U1,W8, I3,A1* | 5.275 *U1* | 5.80 *U1* | 6.45 *U1* | 5.75 *A5, R3,N4,W1* |
| | Cleveland, Ohio | 4.36 *R3* | 4.36 *R3* | 5.40 *A5,C13* | | 6.625 *A5*<br>6.665 *C13* | 6.45 *R3* | 4.225 *J3*<br>4.285 *R3* | 5.275 *J3* | | 6.45 *J3,R3* | 5.75 *A5, C13* |
| | Detroit, Mich. | 4.45 *R5,G3* | | 5.40 *R5*<br>5.60 *B5,P8*<br>5.65 *P3* | 5.075 *R5*<br>5.225 *G3* | 6.625 *R5*<br>6.825 *B5,P3, P8* | 6.60 *G3* | 4.375 *G3* | | | 6.60 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 5.75 *A5* |
| | Gary, Ind. Harbor, Crawfordsville | 4.30 *I3, U1, Y1* | 4.30 *I3, U1, Y1* | 5.40 *M5*<br>5.47 *R3* | 5.075 *I3, U1, Y1* | 6.525 *M5*<br>6.695 *R3* | 6.45 *U1,I3, Y1* | 4.225 *I3, U1,Y1* | 5.275 *I3* | 5.80 *U1,Y1* | 6.45 *U1,I3, Y1* | 5.85 *M4* |
| | Granite City, Ill. | | | | | | | 4.425 *G2* | | | | |
| | Kokomo, Ind. | | | | | | | | | | | 5.85 *C9* |
| | Sterling, Ill. | 4.40 *N4* | 4.40 *N4* | | | | | | | | | 5.85 *N4* |
| | Niles, Ohio<br>Sharon, Pa. | 4.34 *R3* | | | | | 6.45 *R3* | 4.225 *S1* | | 5.80 *S1* | 6.45 *S1* | |
| | Pittsburgh, Pa.<br>Midland, Pa. | 4.30 *J3, U1, C11* | 4.30 *J3, U1* | 5.40 *A5,C8,C11 J3,W10,B4*<br>5.46 *R3* | 5.075 *U1,C11* | 6.625 *A5,C11 W10,C8*<br>6.685 *R3* | 6.45 *J3, U1* | 4.225 *J3, U1* | 5.275 *U1* | 5.80 *U1* | 6.45 *J3, U1* | 5.75 *A5,J3, P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 5.75 *P7* |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.30 *W3* | | | | | | 4.225 *W3, W5* | | | | |
| | Youngstown, Ohio | 4.30 *U1,Y1,C10*<br>4.35 *R3* | 4.30 *U1,Y1*<br>4.35 *R3* | 5.40 *F2,Y1, C10* | 5.075 *U1,Y1, C10* | 6.625 *Y1,C10*<br>6.665 *F2* | 6.45 *U1,Y1* | 4.225 *U1,Y1* | | 5.80 *Y1* | 6.45 *Y1* | 5.75 *Y1* |
| WEST | Emeryville, Cal. | 5.05 *J5* | 5.05 *J5* | | | | | | | | | |
| | Fontana, Cal. | 5.00 *K1* | 5.00 *K1* | | 6.125 *K1* | | 7.70 *K1* | 4.875 *K1* | | 6.45 *K1* | 7.15 *K1* | |
| | Geneva, Utah | | | | | | | 4.225 *C7* | | | 6.45 *C7* | |
| | Kansas City, Mo. | 4.90 *S2* | 4.90 *S2* | | 5.675 *S2* | | 7.05 *S2* | | | | | 6.35 *S2* |
| | Los Angeles, Torrance, Cal. | 5.00 *B2,C7* | 5.00 *B2,C7* | 6.85 *R3* | 6.125 *B2* | | 7.15 *B2* | | | | | 6.70 *B2* |
| | Minnequa, Colo. | 4.75 *C6* | 4.75 *C6* | | | | | 5.075 *C6* | | | | 5.90 *C6* |
| | Portland, Ore. | 4.90 *O2* | | | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.00 *C7,P9*<br>5.05 *B2* | 5.00 *C7,P9*<br>5.05 *B2* | | | | 7.20 *B2* | | | | | 6.70 *C7* |
| | Seattle, Wash. | 5.05 *B2,P12, N6* | 5.05 *B2,P12* | | | | 7.20 *B2* | 5.125 *B2* | | 6.70 *B2* | 7.35 *B2* | |
| SOUTH | Atlanta, Ga. | 4.50 *A8* | 4.50 *A8* | | | | | | | | | 5.95 *A8* |
| | Fairfield, Ala. City, Birmingham, Ala. | 4.30 *T2,C16*<br>4.33 *R3* | 4.30 *T2,C16*<br>4.33 *R3* | | | | 6.45 *T2* | 4.225 *T2*<br>4.255 *R3* | | | 6.45 *T2* | 5.75 *R3, T2* |
| | Houston, Ft. Worth, Lone Star, Tex. | 4.70 *S2* | 4.70 *S2* | | 5.475 *S2* | | 6.85 *S2* | 4.55 *L3*<br>4.625 *S2* | | 6.20 *S2* | 6.85 *S2* | 6.25 *S2* |

# Steel Prices

*(Effective Sept. 21, 1954)*

## Key to Steel Producers

**With Principal Offices**

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angell Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, O.
*A8* Atlantic Steel Co., Atlanta, Ga.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Pacific Coast Steel Corp., San Francisco
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C3* Central Iron & Steel Co., Harrisburg, Pa.
*C4* Claymont Products Dept., Claymont, Del.
*C5* Cold Metal Products Co., Youngstown, O.
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Pittsburgh, Pa.
*C11* Crucible Steel Co. of America, New York
*C12* Cumberland Steel Co., Cumberland, Md.
*C13* Cuyahoga Steel & Wire Co., Cleveland
*C14* Compressed Steel Shafting Co., Readville, Mass.
*C15* G. O. Carlson, Inc., Thorndale, Pa.
*C16* Connors Steel Div., Birmingham

*D1* Detroit Steel Corp., Detroit
*D2* Detroit Tube & Steel Div., Detroit
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire Steel Co., Mansfield, O.

*F1* Firth Sterling, Inc., McKeesport, Pa.
*F2* Fitzsimmons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G1* Globe Iron Co., Jackson, O.
*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit
*G4* Greer Steel Co., Dover, O.

*H1* Hanna Furnace Corp., Detroit

*I2* Ingersoll Steel Div., Chicago
*I3* Inland Steel Co., Chicago
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Joslyn Mfg. & Supply Co., Chicago
*J5* Judson Steel Corp., Emeryville, Calif.

*K1* Kaiser Steel Corp., Fontana, Cal.
*K2* Keystone Steel & Wire Co., Peoria
*K3* Koppers Co., Granite City, Ill.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O.
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid-States Steel & Wire Co., Crawfordsville, Ind.
*M5* Monarch Steel Co., Inc., Hammond, Ind.
*M6* Mystic Iron Works, Everett, Mass.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Div., Pittsburgh
*N3* Niles Rolling Mill Div., Niles, O.
*N4* Northwestern Steel & Wire Co., Sterling, Ill.
*N5* Newport Steel Corp., Newport, Ky.
*N6* Northwest Steel Rolling Mills, Seattle
*N7* Newman Crosby Steel Co., Pawtucket, R. I.

*O1* Oliver Iron & Steel Co., Pittsburgh
*O2* Oregon Steel Mills, Portland

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Iron & Steel Co., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P5* Pittsburgh Screw & Bolt Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.
*P11* Production Steel Strip Corp., Detroit
*P12* Pacific Steel Rolling Mills, Seattle

*R1* Reeves Steel & Mfg. Co., Dover, O.
*R2* Reliance Div., Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co., John A., Trenton, N. J.
*R5* Rotary Electric Steel Co., Detroit
*R6* Rodney Metals, Inc., New Bedford, Mass.
*R7* Rome Strip Steel Co., Rome, N. Y.

*S1* Sharon Steel Corp., Sharon, Pa.
*S2* Sheffield Steel Corp., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw & Steel Co., Fitchburg, Mass.
*S5* Sweet's Steel Co., Williamsport, Pa.
*S6* Standard Forging Corp., Chicago
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Corp., Carnegie, Pa.

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T6* Tremont Nail Co., Wareham, Mass.
*T7* Texas Steel Co., Fort Worth

*U1* United States Steel Corp., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.
*U3* Ulbrich Stainless Steels, Wallingford, Conn.
*U4* U. S. Pipe & Foundry Co., Birmingham

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago
*W8* Wisconsin Steel Co., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wycoff Steel Co., Pittsburgh
*W11* Worcester Pressed Steel Co., Worcester, Mass.

*Y1* Youngstown Sheet & Tube Co., Youngstown

## PIPE AND TUBING

**Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

| | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½-3 In. | | 2 In. | | 2½ In. | | 3 In. | | 3½-4 In. | |
| | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| STANDARD T. & C. | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 21.75 | 6.5 | 24.75 | 10.5 | 27.25 | 14.0 | 29.75 | 14.75 | 30.25 | 15.75 | 30.75 | 16.25 | 32.25 | 16.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana *K1* | 10.75 | +4.5 | 13.75 | +0.5 | 16.25 | 3.0 | 18.75 | 3.75 | 19.25 | 4.75 | 19.75 | 5.25 | 21.25 | 5.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *J3* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | 13.5 | +1.50 | 17.5 | 0.75 | 20.0 | 3.25 | 21.5 | 4.75 |
| Alton, Ill. *L1* | 21.75 | 6.5 | 24.75 | 10.5 | 27.25 | 14.0 | 29.75 | 14.75 | 30.25 | 15.75 | 30.75 | 16.25 | 32.25 | 16.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon *M3* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fairless *N2* | 21.75 | 6.5 | 24.75 | 10.5 | 27.25 | 14.0 | 29.75 | 14.75 | 30.25 | 15.75 | 30.75 | 16.25 | 32.25 | 16.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *N1* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | 13.5 | +1.50 | 17.5 | 0.75 | 20.0 | 3.25 | 21.5 | 4.75 |
| Wheeling *W5* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheatland *W4* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *Y1* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | 13.5 | +1.50 | 17.5 | 0.75 | 20.0 | 3.25 | 21.5 | 4.75 |
| Indiana Harbor *Y1* | 22.75 | 7.5 | 25.75 | 11.5 | 28.25 | 15.0 | 30.75 | 15.75 | 31.25 | 16.75 | 31.75 | 17.25 | 33.25 | 17.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorain *N2* | 23.75 | 8.5 | 26.75 | 12.5 | 29.25 | 16.0 | 31.75 | 16.75 | 32.25 | 17.75 | 32.75 | 18.25 | 34.25 | 18.0 | 13.5 | +1.50 | 17.5 | 0.75 | 20.0 | 3.25 | 21.5 | 4.75 |
| EXTRA STRONG PLAIN ENDS | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 25.25 | 11.5 | 29.25 | 15.5 | 31.25 | 19.0 | 31.75 | 17.75 | 32.25 | 18.75 | 32.75 | 19.25 | 33.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fairless *N2* | 25.25 | 11.5 | 29.25 | 15.5 | 31.25 | 19.0 | 31.75 | 17.75 | 32.25 | 18.75 | 32.75 | 19.25 | 33.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Fontana *K1* | 14.25 | ..... | 18.25 | ..... | 20.25 | ..... | 20.75 | ..... | 21.25 | ..... | 21.75 | ..... | 22.25 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *J3* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.25 | 35.25 | 20.0 | 14.0 | ..... | 19.0 | 3.25 | 21.5 | 5.75 | 26.5 | 10.75 |
| Alton, Ill. *L1* | 25.25 | 11.5 | 29.25 | 15.5 | 31.25 | 19.0 | 31.75 | 17.75 | 32.25 | 18.25 | 32.75 | 19.25 | 33.25 | 18.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sharon *M3* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.75 | 35.25 | 20.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pittsburgh *N1* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.75 | 35.25 | 20.0 | 14.0 | ..... | 19.0 | 3.25 | 21.5 | 5.75 | 26.5 | 10.75 |
| Wheeling *W5* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.75 | 35.25 | 20 0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Wheatland *W4* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.75 | 35.25 | 20.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Youngstown *Y1* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.75 | 35.25 | 20.0 | 14.0 | ..... | 19.0 | 3.25 | 21.5 | 5.75 | 26.5 | 10.75 |
| Indiana Harbor *Y1* | 26.25 | 12.5 | 30.25 | 16.5 | 32.25 | 20.0 | 32.75 | 18.75 | 33.25 | 19.75 | 33.75 | 20.75 | 34.25 | 19.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Lorain *N2* | 27.25 | 13.5 | 31.25 | 17.5 | 33.25 | 21.0 | 33.75 | 19.75 | 34.25 | 20.75 | 34.75 | 21.75 | 35.25 | 20.0 | 14.0 | ..... | 19.0 | 3.25 | 21.5 | 5.75 | 26.5 | 10.75 |

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt. higher discount. Buttweld jobbers' discount, 5 pct.

Galvanized discounts based on zinc price in range of over 9¢ to 11¢ incl. per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price in range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

# Steel Prices

*(Effective Sept. 21, 1954)*

*To identify producers, see Key on preceding page.*

## RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Screw Spikes | Tie Plates | Track Bolts Treated |
|---|---|---|---|---|---|---|---|
| Bessemer *U1* | 4.45 | 5.35 | 5.425 | ..... | ..... | ..... | ..... |
| So. Chicago *R3* | ..... | ..... | ..... | 7.30 | ..... | ..... | ..... |
| Ensley *T2* | 4.45 | 5.35 | ..... | ..... | ..... | ..... | ..... |
| Fairfield *T2* | ..... | 5.35 | ..... | 7.30 | ..... | 5.275 | ..... |
| Gary *U1* | 4.45 | 5.35 | ..... | ..... | ..... | 5.275 | ..... |
| Ind. Harbor *I3* | 4.45 | ..... | 5.425 | 7.30 | ..... | 5.275 | ..... |
| Johnstown *B3* | ..... | 5.35 | ..... | ..... | ..... | ..... | ..... |
| Joliet *U1* | ..... | 5.35 | 5.425 | ..... | ..... | ..... | ..... |
| Kansas City *S2* | ..... | ..... | ..... | 7.30 | ..... | ..... | 11.50 |
| Lackawanna *B3* | 4.45 | 5.35 | 5.425 | ..... | ..... | 5.275 | ..... |
| Minnequa *C6* | 4.45 | 5.85 | 5.425 | 7.30 | ..... | 5.275 | 11.50 |
| Pittsburgh *O1* | ..... | ..... | ..... | ..... | 11.00 | ..... | 11.50 |
| Pittsburgh *P5* | ..... | ..... | ..... | ..... | 11.00 | ..... | 11.50 |
| Pittsburgh *J3* | ..... | ..... | ..... | 7.30 | ..... | ..... | ..... |
| Seattle *B2* | ..... | ..... | ..... | 7.80 | ..... | 5.425 | 11.50 |
| Steelton *B3* | 4.45 | ..... | 5.425 | ..... | ..... | 5.275 | ..... |
| Struthers *Y1* | ..... | ..... | ..... | 7.30 | ..... | ..... | ..... |
| Torrance *C7* | ..... | ..... | ..... | ..... | ..... | 5.425 | ..... |
| Williamsport *S5* | ..... | 5.35 | ..... | ..... | ..... | ..... | ..... |
| Youngstown *R3* | ..... | ..... | ..... | 7.30 | ..... | ..... | ..... |

## ELECTRICAL SHEETS

| 22-Gage F.o.b. Mill Cents Per Lb | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) Semi-Processed | Cold-Reduced (Coiled or Cut Length) Fully Processed |
|---|---|---|---|
| Field | 8.025 | 8.225 | ..... |
| Armature | 8.50 | 8.75 | 9.25 |
| Elect. | 9.10 | 9.35 | 9.85 |
| Motor | 10.10 | 10.35 | 10.85 |
| Dynamo | 11.00 | 11.25 | 11.75 |
| Trans. 72 | 11.95 | 12.20 | 12.70 |
| Trans. 65 | 12.50 | Grain Oriented | |
| Trans. 58 | 13.00 | Trans. 80 | 16.60 |
| Trans. 52 | 14.00 | Trans. 73 | 17.10 |

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N5*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

## CLAD STEEL

| Stainless-carbon | Plate | Sheet |
|---|---|---|
| No. 304, 20 pct. | | |
| Coatesville, Pa., *L4* | *33.20 | |
| Washington, Pa., *J2* | ..... | |
| Claymont, Del., *C4* | ..... | |
| New Castle, Ind., *I2* | ..... | 32.50 |
| Nickel-carbon | | |
| 10 pct. Coatesville, Pa., *L4* | 38.30 | |
| Inconel-carbon | | |
| 10 pct., Coatesville, Pa., *L4* | 46.90 | |
| Monel-carbon | | |
| 10 pct. Coatesville, Pa., *L4* | 39.70 | |

* Includes annealing and pickling, sandblasting.

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails Col | Woven Wire Fence 9-15½ ga. Col | "T" Fence Posts Col | Single Loop Bale Ties Col | Galv. Barbed and Twisted Barbless Wire Col | Merch. Wire Ann'ld ¢/lb. | Merch. Wire* Galv. ¢/lb. |
|---|---|---|---|---|---|---|---|
| Alabama City *R3* | 137 | 146 | ... | 155 | 159 | 6.90 | 7.30 |
| Aliquippa, Pa. *J3* | 137 | 149 | ... | ... | 156 | 6.90 | 7.45 |
| Atlanta *A8* | 139 | 151 | ... | 157 | 164 | 7.00 | 7.55 |
| Bartonville *K2* | 139 | 151 | ... | 157 | 164 | 7.00 | 7.55 |
| Buffalo *W6* | ... | ... | ... | ... | ... | 6.90 | 7.30 |
| Chicago, Ill. *N4* | 137 | 149 | ... | 155 | 162 | 6.90 | 7.45 |
| Cleveland *A6* | 142 | ... | ... | ... | ... | ... | ... |
| Cleveland *A5* | ... | ... | ... | ... | ... | 6.90 | ... |
| Crawfordsville *M4* | 139 | 151 | ... | 157 | 159 | 7.00 | 7.55 |
| Donora, Pa. *A5* | 137 | 146 | ... | 155 | 159 | 6.90 | 7.30 |
| Duluth *A5* | 137 | 146 | 150 | 155 | 159 | 6.90 | 7.30 |
| Fairfield, Ala. *T2* | 137 | 146 | ... | 155 | 159 | 6.90 | 7.30 |
| Galveston *D4* | 139 | ... | ... | ... | ... | ... | ... |
| Houston *S2* | 145 | 154 | ... | ... | 167 | 7.30 | 7.70 |
| Johnstown, Pa. *B3* | 137 | 149 | ... | ... | 162 | 6.90 | 7.45 |
| Joliet, Ill. *A5* | 137 | 146 | ... | 155 | 159 | 6.90 | 7.30 |
| Kokomo, Ind. *C9* | 139 | 148 | ... | 157 | 161 | 7.00 | 7.55 |
| Los Angeles *B2* | ... | ... | ... | ... | ... | 7.85 | ... |
| Kansas City *S2* | 148 | 158 | ... | 167 | 171 | 7.50 | 7.90 |
| Minnequa *C6* | 142 | 156 | 150 | 160 | 168 | 7.15 | 7.55 |
| Monessen *P6* | 137 | 151 | ... | ... | 163 | 6.90 | 7.45 |
| Moline, Ill. *R3* | ... | ... | 145 | ... | ... | ... | ... |
| Pittsburg, Cal. *C7* | 156 | 169 | ... | 179 | 179 | 7.85 | 8.25 |
| Portsmouth *P7* | ... | ... | ... | ... | ... | 6.90 | 7.30 |
| Rankin, Pa. *A5* | 137 | 146 | ... | ... | 159 | 6.90 | 7.30 |
| So. Chicago *R3* | 137 | 146 | 145 | 155 | 159 | 6.90 | 7.30 |
| S. San Francisco *C6* | ... | ... | ... | ... | 179 | ... | ... |
| Sparrows Pt. *B3* | 139 | ... | ... | 157 | 164 | 7.00 | 7.55 |
| Struthers, O. *Y1* | ... | ... | ... | ... | ... | 6.90 | 7.55 |
| Worcester *A5* | 143 | ... | ... | ... | ... | 7.20 | ... |
| Williamsport, Pa. *S5* | ... | ... | 150 | ... | ... | ... | ... |

Cut Nails, carloads, base $8.30 per keg at Conshohocken, Pa. (*A2*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

## C-R SPRING STEEL

| Cents Per Lb F.o.b. Mill | CARBON CONTENT 0.26–0.40 | 0.41–0.60 | 0.61–0.80 | 0.81–1.05 | 1.06–1.35 |
|---|---|---|---|---|---|
| Bridgeport, New Britain, Conn. *S7* | 5.75 | 8.05 | 9.00 | 11.15 | 13.85 |
| Buffalo, N. Y. *R7* | 5.75 | 8.05 | 9.00 | 10.95 | 13.25 |
| Carnegie, Pa. *S9* | ..... | 8.05 | 9.00 | 11.15 | 13.85 |
| Cleveland *A5* | 5.75 | 8.05 | 9.00 | 11.15 | 13.85 |
| Detroit *D1* | 5.90 | 8.25 | 9.20 | 10.95 | ..... |
| Detroit *D2* | 5.90 | 8.25 | 9.20 | ..... | 14.61 |
| Harrison, N. J. *C11* | ..... | ..... | 9.30 | 11.45 | 14.15 |
| Indianapolis *C5* | 6.00 | 8.20 | 9.00 | 11.15 | 13.85 |
| New Castle, Pa. *B4* | 5.75 | 8.05 | 9.00 | 10.95 | ..... |
| New Haven, Conn. *D1* | 6.20 | 8.35 | 9.30 | 11.25 | ..... |
| Pawtucket, R. I. *N7* | 6.30 | 8.35 | 9.30 | 11.45 | 14.15 |
| Riverdale, Ill. *A1* | 5.85 | 8.05 | 9.00 | 11.15 | 13.85 |
| Sharon, Pa. *S1* | 5.75 | 8.05 | 9.00 | 11.15 | 13.85 |
| Trenton *R4* | ..... | 8.35 | 9.30 | 11.25 | 13.90 |
| Wallingford *W1* | 6.20 | 8.35 | 9.30 | 11.45 | 14.15 |
| Warren, Ohio *T4* | 5.75 | 8.05 | 9.00 | 10.95 | 13.25 |
| Weirton, W. Va. *W3* | 5.85 | 8.05 | 9.00 | 10.95 | 13.25 |
| Worcester, Mass. *A5* | 6.60 | 8.35 | 9.30 | 11.45 | 14.15 |
| Youngstown *C5* | 5.85 | 8.06 | 9.00 | 11.15 | 13.85 |

* Sold on Pittsburgh base.

## WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

| Cities | City Delivery Charge | Sheets: Hot-Rolled | Sheets: Cold-Rolled (15 gage) | Sheets: Galvanized (10 gage) | Strip: Hot-Rolled | Strip: Cold-Rolled | Plates | Shapes: Standard Structural | Bars: Hot-Rolled | Bars: Cold-Finished | Alloy Bars: Hot-Rolled A 4615 As Rolled | Alloy Bars: Hot-Rolled A 4140 Annealed | Alloy Bars: Cold-Drawn A 4615 As Rolled | Alloy Bars: Cold-Drawn A 4140 Annealed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baltimore | $.20 | 6.22 | 7.51 | 7.78 | 6.89 | ..... | 6.57 | 6.92 | 6.88 | 8.52 | ..... | ..... | ..... | ..... |
| Birmingham | .15 | 6.35–6.50 | 7.35–8.10 | 8.25–9.00 | 6.60 | 9.60 | 6.65 | 6.65 | 6.50 | 9.00 | ..... | ..... | ..... | ..... |
| Boston | .10 | 7.23 | 8.23 | 9.42–9.52 | 7.47 | 9.65–9.85 | 7.34–7.37 | 7.49 | 7.20 | 8.60–8.70 | 12.60–12.80 | 12.45–12.46 | 15.15 | 15.10 |
| Buffalo | .20 | 6.35–6.40 | 7.40[3]–7.45 | 8.80–8.84 | 6.70–6.75 | ..... | 6.65–6.70 | 6.70–6.77 | 6.50–6.55 | 7.85[3]–7.90 | 12.50 | 12.15[3] | 14.85 | 14.75–14.80[3] |
| Chicago | .20 | 6.38 | 7.38 | 8.30 | 6.62 | ..... | 6.52 | 6.69 | 6.51 | 7.50 | 12.25 | 11.90 | 14.60 | 14.55 |
| Cincinnati | .15 | 6.49–6.53 | 7.37–7.42 | 8.25–8.30 | 6.86–6.91 | ..... | 6.81–6.86 | 6.91 | 6.75–6.80 | 7.80–7.85 | 12.55 | 12.15–12.20 | 14.90 | 14.80–14.85 |
| Cleveland | .20 | 6.38 | 7.38 | 8.45 | 6.72 | ..... | 6.69 | 7.02 | 6.57 | 7.60 | 11.96 | ..... | ..... | 14.61 |
| Denver | ..... | 7.85 | 8.85 | 10.02 | 8.20 | ..... | 7.95 | 7.95 | 8.05 | 9.05 | ..... | ..... | ..... | ..... |
| Detroit | .20 | 6.57 | 7.57 | 8.50–8.58 | 6.90 | ..... | 6.80–6.85 | 7.16 | 6.79 | 7.77 | 12.45 | 12.10 | 14.80 | 14.75 |
| Houston | .20 | 7.35 | 7.65–7.80 | 9.93 | 7.70 | ..... | 7.35 | 7.60 | 7.70 | 9.50–9.60 | ..... | 13.10 | ..... | ..... |
| Kansas City | .20 | 7.05 | 8.05 | 8.95 | 7.29 | ..... | 7.19 | 7.36 | 7.18 | 8.07–8.27 | ..... | 12.27 | ..... | ..... |
| Los Angeles | .20 | 7.40 | 9.25 | 9.55–9.85 | 7.75 | ..... | 7.35 | 7.55 | 7.35–7.45 | 10.05 | ..... | 13.20 | ..... | 16.35 |
| Memphis | .10 | 6.79 | 7.69 | ..... | 6.90 | ..... | 7.01 | 7.09 | 6.88 | 8.24 | ..... | ..... | ..... | ..... |
| Milwaukee | .20 | 6.47 | 7.47 | 8.21–8.39 | 6.71 | ..... | 6.61 | 6.86 | 6.60 | 7.69 | 12.34 | 11.99 | 14.69 | 14.64–14.84 |
| New Orleans | .15 | 6.70 | 7.65 | 9.23 | 6.80 | ..... | 6.90–6.95 | 7.05 | 6.80 | 8.70–10.70 | ..... | ..... | ..... | ..... |
| New York | .10 | 6.97–6.98 | 7.78–8.46 | 8.79[1]–8.99 | 7.36–7.56 | ..... | 7.18–7.27 | 7.13–7.38 | 7.30–7.37 | 8.63–8.73[2] | 12.63 | 12.28 | ..... | 14.93 |
| Norfolk | .20 | 7.00 | ..... | ..... | 7.10 | ..... | 7.10 | 7.10 | 7.10 | 8.60 | ..... | ..... | ..... | ..... |
| Philadelphia | .10 | 6.19 | 7.29[3] | 8.09[4]–8.23 | 6.96 | ..... | 6.49 | 6.54 | 6.74 | 8.19[3] | ..... | 11.66–11.96[3] | ..... | 14.61[3] |
| Pittsburgh | .20 | 6.38 | 7.38 | 8.30–8.50 | 6.72–6.75 | ..... | 6.52 | 6.69 | 6.51 | 7.85 | 12.25 | 11.90 | 14.60 | 14.55 |
| Portland | .20 | 7.60 | 8.75 | 9.05 | 7.85 | ..... | 7.45 | 7.50 | 7.55 | 10.95 | ..... | ..... | ..... | ..... |
| Salt Lake City | .20 | 7.65 | 10.20 | 10.70 | 9.05 | ..... | 7.70 | 7.70–8.85 | 8.80 | 10.95 | ..... | ..... | ..... | ..... |
| San Francisco | .20 | 7.55 | 8.95 | 9.35–9.85 | 7.80 | ..... | 7.40 | 7.50 | 7.35 | 10.05 | ..... | 13.20 | ..... | 16.35 |
| Seattle | .00 | 8.10 | 9.80 | 10.15 | 8.20 | ..... | 7.80 | 7.75 | 7.80 | 10.95 | ..... | 13.65 | ..... | 16.30 |
| St. Louis | .20 | 6.62–6.67 | 7.67 | 8.54–8.59 | 6.91 | ..... | 6.81 | 7.09 | 6.80 | 7.89 | 12.54 | 12.19 | 14.84–14.89 | 14.45–14.84 |
| St. Paul | .15 | 7.03 | 8.03–8.58 | 8.96 | 7.28 | ..... | 7.19 | 7.35 | 7.16 | 8.26 | ..... | 12.56 | ..... | 15.21 |

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

## BOILER TUBES

| $ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill | Size OD-In. | Size B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. | Elec. Weld C.D. |
|---|---|---|---|---|---|---|
| Babcock & Wilcox | 2 | 13 | 28.33 | 33.97 | 27.48 | 32.95 |
| | 2½ | 12 | 38.15 | 45.74 | 37.00 | 44.36 |
| | 3 | 12 | 44.05 | 52.82 | 42.72 | 51.23 |
| | 3½ | 11 | 51.43 | 61.66 | 49.88 | 59.81 |
| | 4 | 10 | 68.29 | 81.88 | 66.24 | 79.42 |
| National Tube | 2 | 13 | 28.33 | 33.97 | 27.48 | ..... |
| | 2½ | 12 | 38.15 | 45.74 | 37.00 | ..... |
| | 3 | 12 | 44.05 | 52.82 | 42.72 | ..... |
| | 3½ | 11 | 51.43 | 61.66 | 49.88 | ..... |
| | 4 | 10 | 68.29 | 81.88 | 66.24 | ..... |
| Pittsburgh Steel | 2 | 13 | 28.33 | 33.97 | ..... | ..... |
| | 2½ | 12 | 38.15 | 45.74 | ..... | ..... |
| | 3 | 12 | 44.05 | 52.82 | ..... | ..... |
| | 3½ | 11 | 51.43 | 61.66 | ..... | ..... |
| | 4 | 10 | 68.29 | 81.88 | ..... | ..... |

# Miscellaneous Prices

*(Effective Sept. 21, 1954)*

## TOOL STEEL

*F.o.b. Mill*

| W | Cr | V | Mo | Co | Base per lb |
|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.54 |
| 18 | 4 | 1 | — | 5 | 2.245 |
| 18 | 4 | 2 | — | — | 1.705 |
| 1.5 | 4 | 1.5 | 8 | — | .90 |
| 6 | 4 | 2 | 6 | — | 1.29 |
| High-carbon chromium | | | | | .75 |
| Oil hardened manganese | | | | | .405 |
| Special carbon | | | | | .37 |
| Extra carbon | | | | | .31 |
| Regular carbon | | | | | .26 |

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

## CAST IRON WATER PIPE

| | Per Net Ton |
|---|---|
| 6 to 24-in., del'd Chicago | $111.50 to $115.30 |
| 6 to 24-in., del'd N. Y. | 115.00 to 116.00 |
| 6 to 24-in., Birmingham | 98.00 to 102.50 |
| 6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less | $129.50 to $131.50 |

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

## LAKE SUPERIOR ORES

*51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.*

| | Gross Ton |
|---|---|
| Openhearth lump | $11.15 |
| Old range, bessemer | 10.30 |
| Old range, nonbessemer | 10.15 |
| Mesabi, bessemer | 10.05 |
| Mesabi, nonbessemer | 9.90 |
| High phosphorus | 9.90 |

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

## COKE

| | Net-Ton |
|---|---|
| Furnace, beehive (f.o.b. oven) Connellsville, Pa. | $14.25 to $14.50 |
| Foundry, beehive (f.o.b. oven) Connellsville, Pa. | $16.50 to $17.00 |
| Foundry, oven coke | |
| Buffalo, del'd | $28.08 |
| Chicago, f.o.b. | 24.50 |
| Detroit, f.o.b. | 25.50 |
| New England, del'd | 26.05 |
| Seaboard, N. J., f.o.b. | 24.00 |
| Philadelphia, f.o.b. | 23.00 |
| Swedeland, Pa., f.o.b. | 23.00 |
| Painesville, Ohio, f.o.b. | 25.50 |
| Erie, Pa., f.o.b. | 25.00 |
| Cleveland, del'd | 27.43 |
| Cincinnati, del'd | 26.56 |
| St. Paul, f.o.b. | 23.75 |
| St. Louis, f.o.b. | 26.00 |
| Birmingham, f.o.b. | 22.65 |
| Lone Star, Tex., f.o.b. | 18.50 |

## ELECTRODES

*Cents per lb, f.o.b. plant, threaded, with nipples, unboxed*

| GRAPHITE | | | CARBON | | |
|---|---|---|---|---|---|
| Diam. (In.) | Length (In.) | Price | Diam. (In.) | Length (In.) | Price |
| 24 | 84 | 20.50 | 40 | 100, 110 | 8.95 |
| 20 | 72 | 20.00 | 35 | 110 | 8.95 |
| 12 to 18 | 72 | 20.50 | 30 | 110 | 8.95 |
| 7 to 10 | 60 | 21.00 | 24 | 72 to 84 | 9.10 |
| 8 | 60 | 23.25 | 20 | 90 | 8.95 |
| 4 | 40 | 26.00 | 17 | 72 | 9.10 |
| 3 | 40 | 27.25 | 14 | 72 | 9.50 |
| 2½ | 30 | 28.00 | 10, 12 | 60 | 10.30 |
| 2 | 24 | 43.50 | 8 | 60 | 10.55 |

## BOLTS, NUTS, RIVETS, SCREWS

*(Base discount, f.o.b. mill)*

### Machine and Carriage Bolts

| | Discount Less Case | C. |
|---|---|---|
| ½ in. & smaller x 4 in. & shorter | 2 | 22 |
| ½ in. & smaller x 6 in. & shorter | +3 | 18 |
| 9/16 in. & ⅝ in. x 6 in. & shorter | +4 | 17 |
| ¾ in. & larger x 6 in. & shorter | +6 | 15 |
| All diam. longer than 6 in. | +15 | 8 |
| ½ in. & smaller x 6 in. & shorter | +3 | 18 |
| Lag, all diam. x 6 in. & shorter | 6 | 25 |
| Lag, all diam. longer than 6 in. | +2 | 19 |
| Plow bolts | 23 | 23 |

### Stove Bolts

Packaged, package list ..... 44½—10
Bulk bulk list* ..... 59

*Minimum quantity per item: 15,000 pieces lengths to 3"; 5,000 pieces lengths over 3". Special finishes: Zinc, Parkerized, cadmium or nickel add 6¢ per lb net. Black oil finish add 2¢ per lb net.

### Nuts, H.P., C.P., reg. & hvy.

| | Base Discount | Discount, Case or Keg |
|---|---|---|
| ¾" or smaller | 55 | 64 |
| ⅞" to 1⅛" inclusive | 58 | 66 |
| 1¼" to 1½" inclusive | 60 | 67½ |

### C.P. Hex regular & hvy.

| | | |
|---|---|---|
| All sizes | 55 | 64 |

### Hot Galv. Nuts (all types)

| | | |
|---|---|---|
| ¾" or smaller | 38 | 50 |
| ⅞" to 1½" inclusive | 41 | 52½ |

### Finished, Semi-finished, Slotted or Castellated Nuts

| | | |
|---|---|---|
| All sizes | 55 | 66 |

### Rivets

| | Base per 100 lb |
|---|---|
| ½ in. & larger | $9.25 |
| | Pct Off List |
| 7/16 in. and smaller | 37 |

### Cap Screws

| | Discount Bright | H.C. Heat Treated |
|---|---|---|
| New std. hex head, packaged | | |
| ⅝" x 6" and smaller and shorter | 38 | 28 |
| ¾", ⅞", 1" x 6" and shorter | 15 | 1 |
| New std. hex head, bulk* | | |
| ⅝" x 6" and smaller and shorter | 50 | 42 |
| ¾", ⅞", 1" x 6" and shorter | 32 | 21 |

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

### Machine Screws

| | Discount |
|---|---|
| Packaged, gross list | 36 —10 |
| Bulk, bulk list* | 17 |

*Minimum bulk quantity, 15,000 pieces per item.

### Machine Screw & Stove Bolt Nuts

Packaged, package list ..... 36—10
Bulk, bulk list* ..... 17

*Minimum bulk quantity, 15,000 pieces per item.

## REFRACTORIES

### Fire Clay Brick

*Carloads per 1000*

| | |
|---|---|
| First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) | $114.00 |
| No. 1 Ohio | 107.00 |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 107.00 |
| No. 2 Ohio | 98.00 |
| Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) | 17.00 |

### Silica Brick

| | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. | $120.00 |
| Childs, Hays, Pa. | 125.00 |
| Chicago District | 130.00 |
| Western Utah | ..... |
| California | ..... |
| Super Duty Hays, Pa., Athens, Tex., Windham | 137.00 |
| Curtner, Calif. | 155.00 |
| Silica cement, net ton, bulk, Eastern (except Hays, Pa.) | 20.00 |
| Silica cement, net ton, bulk, Hays, Pa. | 22.00 |
| Silica cement, net ton, bulk, Chicago District, Ensley, Ala. | 21.00 |
| Silica cement, net ton, bulk, Utah and Calif. | ..... |

### Chrome Brick

*Per net ton*

| | |
|---|---|
| Standard chemically bonded Balt. | $86.00 |
| Standard chemically bonded, Curtner, Calif. | 96.25 |
| Burned, Balt. | 80.00 |

### Magnesite Brick

| | |
|---|---|
| Standard Baltimore | $109.00 |
| Chemically bonded, Baltimore | 97.50 |

### Grain Magnesite

*St. ⅜-in. grains*

| | |
|---|---|
| Domestic, f.o.b. Baltimore in bulk fines removed | $64.40 |
| Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk | 38.00 |
| in sacks | 43.75 |

### Dead Burned Dolomite

*Per net ton*

| | |
|---|---|
| F.o.b. bulk, producing points in: Pa., W. Va., Ohio | $14.50 |
| Midwest | 14.60 |
| Missouri Valley | 13.65 |

## FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; effective $CaF_2$ content

| | |
|---|---|
| 72½% | $44.00 |
| 70% or more | 42.50 |
| 60% or less | 38.00 |

## METAL POWDERS

*Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.*

| | |
|---|---|
| Swedish sponge iron c.i.f. New York, ocean bags | 11.25¢ |
| Canadian sponge iron, Del'd in East | 12.0¢ |
| F.o.b. ship. pt., carloads | 9.5¢ |
| Domestic sponge iron, 98+% Fe, carload lots | 18.0¢ |
| Electrolytic iron, annealed, 99.5+% Fe | 38.0¢ |
| Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe | 53.5¢ |
| Hydrogen reduced iron minus 300 mesh, 98+% Fe | 63.0¢ to 80.0¢ |
| Carbonyl iron, size 5 to 10 mieron, 98%, 00.8+% Fe | 83.0¢ to $1.48 |
| Aluminum | 21.5¢ |
| Brass, 10 ton lots | 29.50¢ to 36.50¢ |
| Copper, electrolytic | 43.50¢ |
| Copper, reduced | 43.50¢ |
| Cadmium, 100-199 lb. 95¢ plus metal value | |
| Chromium, electrolytic, 99% min., and quality, del'd | 33.60 |
| Lead | 21.00¢ |
| Manganese | 57.0¢ |
| Molybdenum, 99% | $2.75 |
| Nickel, unannealed | 89.50¢ |
| Nickel, annealed | 96.50¢ |
| Nickel, spherical, unannealed | 93.50¢ |
| Silicon | 43.50¢ |
| Solder powder | 7.0¢ to 9.0¢ plus met. value |
| Stainless steel, 302 | 91.0¢ |
| Stainless steel, 316 | $1.10 |
| Tin | 14.04¢ plus metal value |
| Tungsten, 99% (65 mesh) | $4.05 |
| Zinc, 10 ton lots | 17.5¢ to 25.0¢ |

# Ferroalloy Prices

*(Effective Sept. 21, 1954)*

### Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.

| | | | |
|---|---|---|---|
| 0.025% C .. | 36.00 | 0.15% C ... | 33.75 |
| 0.025% C, Simplex .. | 34.50 | 0.20% C ... | 33.50 |
| 0.06% C ... | 34.50 | 0.50% C ... | 33.25 |
| 0.10% C ... | 34.00 | 1.00% C ... | 33.00 |
| 65-69% Cr, 4-9% C | | 2.00% C ... | 32.75 |
| 62-66% Cr, 4-6% C, 6-9% Si | | | 24.75 |
| | | | 25.60 |

### S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

| | |
|---|---|
| Carloads | 25.85 |
| Ton lots | 28.00 |
| Less ton lots | 29.50 |

### High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

### Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

| | |
|---|---|
| 0.10 max. C | $1.18 |
| 0.50% max. C | 1.16 |
| 9 to 11% C | 1.25 |

### Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

### Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00 max. Fe.

| | |
|---|---|
| Carloads | 19.00 |
| Ton lots | 22.10 |
| Less ton lots | 23.60 |

### Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

| | |
|---|---|
| Carloads | 20.00 |
| Ton lots | 22.30 |
| Less ton lots | 23.30 |

### SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

| | |
|---|---|
| Ton lots | 17.50 |
| Less ton lots | 19.50 |

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

| | |
|---|---|
| Carload lots | 16.60 |
| Ton lots | 18.10 |
| Less ton lots | 19.35 |

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%; Ti 9 to 11%, Ca 5 to 7%.

| | |
|---|---|
| Carload packed | 17.50 |
| Ton lots to carload packed | 18.50 |
| Less ton lots | 20.00 |

### Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn;

| Producing Point | Cents per-lb |
|---|---|
| Marrietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. | 9.50 |
| Clairton, Pa. | 9.50 |
| Sheridan, Pa. | 9.50 |
| Philo, Ohio | 9.50 |

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

| | |
|---|---|
| Carloads, bulk | 12.05 |
| Ton lots packed | 13.65 |

### Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

| Manganese | Silicon | |
|---|---|---|
| 16 to 19% | 3% max. | $84.00 |
| 19 to 21% | 3% max. | 86.00 |
| 21 to 23% | 3% max. | 88.50 |
| 23 to 25% | 3% max. | 91.00 |

### Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

| | |
|---|---|
| Carload, packed | 45.00 |
| Ton lots | 43.50 |

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

| | |
|---|---|
| Carloads | 30.00 |
| Ton lots | 33.00 |
| 250 to 1999 lb | 34.00 |
| Premium for hydrogen-removed metal | 0.75 |

### Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

### Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.07% max. C, 0.06% P, 90% Mn | 32.00 | 33.85 | 35.05 |
| 0.07% max. C | 29.95 | 31.80 | 33.80 |
| 0.15% max. C | 28.45 | 30.30 | 31.50 |
| 0.30% max. C | 26.95 | 28.80 | 30.00 |
| 0.50% max. C | 26.45 | 28.30 | 29.50 |
| 0.75% max. C, 80-85% Mn, 5.0-7.0% Si | 23.45 | 25.30 | 26.50 |

### Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

| | |
|---|---|
| Carload bulk | 11.00 |
| Ton lots | 12.65 |
| Briquet contract basis carlots, bulk, delivered, per lb of briquet | 12.65 |
| Ton lots, packed | 14.25 |

### Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $89.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

| | Ton lots | Carloads |
|---|---|---|
| 96% Si, 2% Fe | 20.10 | 18.00 |
| 97% Si, 1% Fe | 20.60 | 18.50 |

### Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

| | |
|---|---|
| Carloads, bulk | 6.75 |
| Ton lots | 8.35 |

### Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

| | | | |
|---|---|---|---|
| 25% Si .... | 20.00 | 75% Si .... | 14.40 |
| 50% Si .... | 12.00 | 85% Si .... | 16.10 |
| 65% Si .... | 13.50 | 90% Si .... | 17.25 |

### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots | $2.05 | $2.95 | $3.75 |
| Less ton lots | 2.40 | 3.30 | 4.55 |

### Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

| | |
|---|---|
| Openhearth | $3.00-$3.10 |
| Crucible | 3.10- 3.20 |
| High speed steel (Primos) .. | 3.20- 3.25 |

### Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

| | |
|---|---|
| Carloads | 9.25¢ |
| Ton lots | 10.15 |

**Calcium molybdate,** 46.3-46.8% f.o.b. Langeloth, Pa., per pound contained Mo ..... $1.15

**Ferrocolumbium,** 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

| | |
|---|---|
| Ton lots | $12.00 |
| Less ton lots | 12.05 |

**Ferro-tantalum-columbium,** 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta..... $6.25

**Ferromolybdenum,** 55-75%, f.o.b. Langleoth, Pa., per pound contained Mo. ..... $1.31

**Ferrophosphorus,** electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton ..... $99.00
10 tons to less carload ..... $110.00

**Ferrotitanium,** 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

**Ferrotitanium,** 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ..... $1.50
Less ton lots ..... 1.55

**Ferrotitanium,** 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ..... $177.00

**Ferrotungsten,** ¼ x down, packed, per pound contained W. ton lots, f.o.b. ..... $3.80

**Molybdic oxide,** briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. ..... $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... $1.13

**Simanal,** 20% Si, 20%Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

| | |
|---|---|
| Carload, bulk, lump | 15.50¢ |
| Ton lots, packed lump | 16.75¢ |
| Less ton lots, lump, packed | 17.25¢ |

**Vanadium Pentoxide,** 86-89% $V_2O_5$ contract basis, per pound contained $V_2O_5$ ..... $1.28

**Zirconium,** contract basis, per lb of alloy

| | |
|---|---|
| 35-40%, f.o.b., freight allowed, ton lots | 26.00¢ |
| 12-15%, del'd, lump, bulk-carloads | 8.00¢ |

### Boron Agents

**Borosil,** contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 314%, Si, 40-45%, per lb contained B.... $5.25

**Bortam,** f.o.b. Niagara Falls

| | |
|---|---|
| Ton lots, per pound | 45¢ |
| Less ton lots, per pound | 50¢ |

**Corbortam,** Ti 15-21%, B 1-2% Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

| | |
|---|---|
| Ton lots per pound | 10.00¢ |

**Ferroboron,** 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.20
F.o.b. Wash., Pa.; 100 lb up

| | |
|---|---|
| 10 to 14% B | .35 |
| 14 to 19% B | 1.20 |
| 19% min. B | 1.50 |

**Grainal,** f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

| | |
|---|---|
| No. 1 | $1.00 |
| No. 6 | 65¢ |
| No. 79 | 50¢ |

**Manganese-Boron,** 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

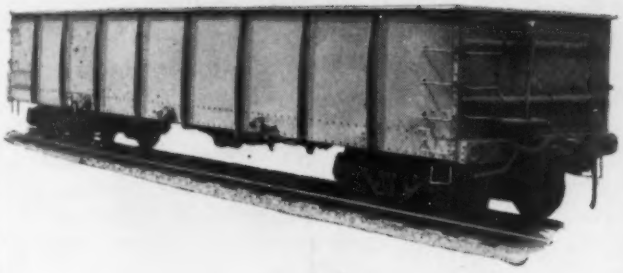
| | |
|---|---|
| Ton lots | $1.46 |
| Less ton lots | 1.57 |

**Nickel-Boron,** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots ..... $2.05

**Silcaz,** Contract basis, delivered

| | |
|---|---|
| Ton lots | 45.00¢ |

# Available FOR SALE or LEASE



## 50 TON HEAVY DUTY GONDOLA CAR

These cars have been completely reconditioned in our own shops and are suitable for mainline interchange or for industrial type service. The heavy, rugged construction will withstand the severe abuse of loading and unloading with clam-shell buckets.

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| | |
|---|---|
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| Load Limit, Approx. | 127,000 Lbs. |
| Light Weight | 41,700 Lbs. |
| Length, Inside | 40 Ft. 6 In. |
| Width, Inside | 9 Ft. 5 In. |
| Height, Inside | 4 Ft. 7 In. |
| Cubic Capacity | 1,765 Cu. Ft. |

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## News of Used and Rebuilt Machinery

**New Model Business** . . . Like every business and trade in Detroit, the used and rebuilt machinery fraternity participates to some extent in new model changeovers in the auto industry.

With each period of downtime, machinery is re-evaluated in terms of the new model and any changes of production methods. Its age and effectiveness for the coming year is also considered. Machines that are old, obsolete, or not needed for the model are frequently offered for sale to used machinery dealers.

This is one of the biggest sources of machinery for the used and rebuilt market. This year consolidation of manufacturing facilities brought about by the mergers of independents has put more equipment onto the market.

**Sell Many Tools** . . . Willys-Overland, for example, offered literally thousands of machine tools, presses and other items. More recently, Hudson had equipment for the market when many of its Detroit manufacturing operations were moved to Kenosha, Wis.

Pickings at Hudson were not very good, however, and dealers complained that a lot of the machinery was too old to bring much on the market.

In the changeovers, however, Ford, Chrysler, Fisher Body and other GM divisions put a variety of tools on the market as they were replaced by new equipment. However, these companies also go to used dealers for some tools, although the bulk of tooling purchases are new equipment.

**Handle Same Equipment** . . . Dealers who service small shops make a profitable business of a cycle that may result in their handling of the same piece of equipment several times in two or three years. It works like this:

Shop "A" has received a small contract for a part for an automotive supplier. He doesn't have the necessary equipment, but he shows what he has in his own shop to a dealer, trades it in for what he needs for this particular job. Time goes by and he finishes this job, then looks around for more business. Perhaps the next contract he is successful in landing needs different equipment so back he goes to his dealer, trades in something he doesn't need for the tools to do the next job.

**Turn Profitable Dollars** . . . Obviously, in servicing a group of shops the dealer can participate in several steps of an operation, keep his inventory moving, and turn a profitable dollar on the same equipment several times in its lifetime.

In general business conditions, presses are in greatest demand in Detroit and even some of the large manufacturers are buying an occasional used press from a dealer.

Another sidelight of the rebuilding business is that some Detroit shops are rebuilding well-known tools and returning them to the shops fully modernized at one-third to one-half the cost of new machines. This involves installing hydraulic drives, heavier spindles and giving them such a renovation that little is left except the basic casting. Since these people aren't necessarily in the used machinery business originally, it is cutting off some of the sources that generally apply to the trade.

**Depreciation A Handicap** . . . Dealers here are beginning to lose sales that normally would have gone to a used machinery dealer to new equipment manufacturers because of the depreciation factor of used versus new. Until recently this had not been much of a factor, although most dealers knew it would come. Depreciation now appears to be a major detriment to the used machinery business here.